ILLINOIS
Dental Journal

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More Reports on the Illinois Dental Health Conference

Volume 17 Number 3

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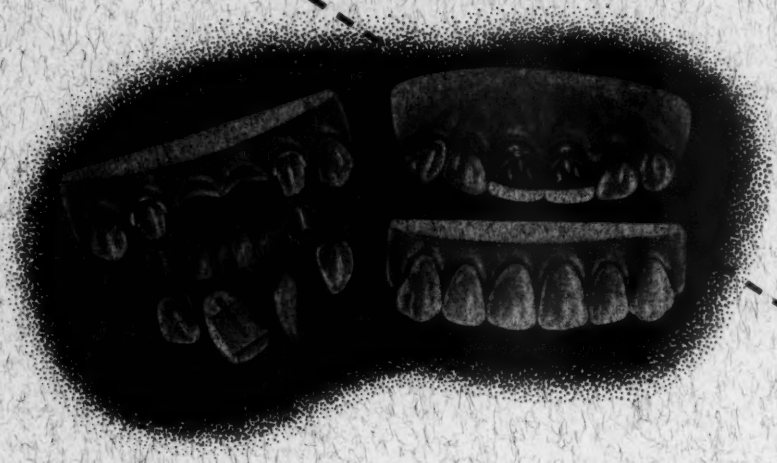

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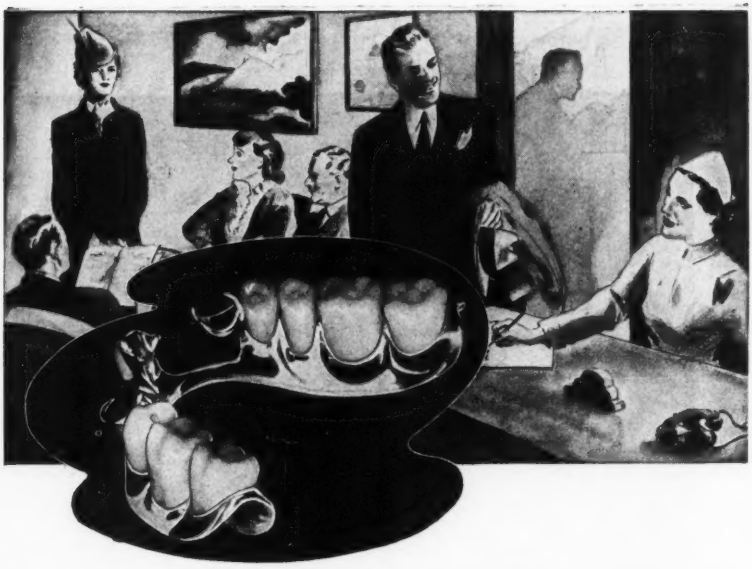

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Councilman Chicago District

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VOLUME 17 MARCH, 1948 NUMBER 3

THE ILLINOIS DENTAL HEALTH CONFERENCE

The first day of the Illinois Dental Health Conference, held on November 7, 8, 9, 1947, Abraham Lincoln Hotel, Springfield, was given over to formal papers. On the second day, November 8, the registrants met in pre-arranged groups under group leaders to discuss particular phases of the dental health problem. The group discussion subjects and leaders were as follows: Group 1, Utilization and Expansion of Dental Personnel and Auxiliary Aids; leader C. E. Chamberlain, D.D.S. Group 2, The Community Dental Health Program; leader Glenn E. Cartwright, D.D.S. Group 3, Responsibilities of Groups and Agencies in Promotion of Dental Health; leader Harold W. Oppice, D.D.S. Group 4, Experimental and Demonstration Projects; leader Lloyd H. Dodd, D.D.S.

The various groups, with the help of the speakers who specialized in the particular field of group, each formulated a report. This report was then given to the entire body assembled on November 9, 1947, the third day of the session. The reports and recommendations of the different groups follow.

The scientific papers and reports printed in this issue which are marked as coming from the Illinois Dental Health Conference, are a part of a symposium sponsored by the Illinois State Dental Society Council on Dental Health and the Illinois Department of Public Health, Division of Public Health Dentistry. Papers from the symposium were also printed in the February JOURNAL. The Conference was held November 7, 8, 9, 1947 at the Abraham Lincoln Hotel, Springfield, Illinois. Hugh M. Tarpley, D.D.S. is Chairman of the Council on Dental Health; R. W. McNulty, M.S., D.D.S., was presiding officer; L. H. Jacob, D.D.S. was Chairman of the Conference Planning Committee; Roland R. Cross, M.D., Director, Illinois State Department of Public Health, and Mr. Baxter K. Richardson, Senior Administrative Officer from the department helped in planning and financing the Conference; John E. Chrietzberg, D.D.S. Chief of the Division of Public Health Dentistry for Illinois, cooperated from his department.

PRESENT STATUS OF PREVENTIVE PROCEDURES

Robert G. Kesel, D.D.S., M.S.*

During the month of September a conference was held at the University of Michigan to evaluate the technics for caries control. I think it was one of the most valuable things that has happened in the field of dental caries in a long while, and I should like to take this opportunity publicly to compliment the man who I believe was the mainspring in the organization of that conference and who I know was the leader in its conduct. He was the speaker who has just preceded me, Dr. Easlick. I think that a great deal of good is going to come from this conference, which was attended by 114 dentists, physicians, scientists, and men prominent in dental health education.

At the conclusion of this workshop, the various committees brought in their reports for discussion and adoption.

I should like to quote from the conclusions of one committee. Only during the past week have the mimeographed conclusions of the various evaluating committees of this conference been made available. I don't know how widely they will be disseminated, but I think that you who are here and who are particularly interested in caries control should have access to them. While the conclusions in the main are negative, nevertheless I think our thinking on this caries problem is crystallized in these conclusions and we see areas pointed out to us where profitable research can be conducted.

The committee that I am particularly interested in for this morning's discussion is the one that evaluated the mechanism of the caries process. I think that for any consideration of caries control we should have an understanding of what caries is and how the disease progresses through the tooth tissue. If we are going to proceed with treatment on a rational basis we should have that common understanding. This evaluating committee had a particularly difficult assignment because of how much has been written and what has been said about why teeth decay, how they proceed to do so, and what is responsible for it.

Definition of Carious Process

So this committee, after serious discussion throughout the week, made this short conclusion about caries. This is their definition of the carious process:

"Dental caries is a disease of calcified tissues of the teeth. It is caused by acid resulting from the action of micro-organs on carbohydrates and is characterized by the decalcification of the inorganic portion and accompanied by or followed by a disintegration of organic substance of the tooth. The lesions of the disease predominantly occur in particular areas of the tooth and their type is determined by the morphology of the tissue in which they appear."

That is a short, concise definition which not only defines caries but sums up, I think, the process by which it is brought about. This, of course, is nothing more or less than a re-statement of the theory that was advanced by W. D. Miller before the turn of the century. At that time it was mainly a theory. Much of the research that has gone into the caries problem during the past fifty years has supported this theory to the point now where this assembled group of scientists and dentists—and many schools of thought were represented—unanimously adopted this conclusion

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that the caries process develops primarily from the decalcification of the tooth by acid formed by the conversion of carbohydrates by the bacteria that are present on the tooth surface.

Methods for Caries Control

With that as a background, then, we can proceed to evaluate the various methods now being used for caries control and to consider the approaches that are being made for restricting caries activity. If caries results from acid formation by the conversion of carbohydrates through bacterial activity, then it should be possible to reduce the amount of decay by several different methods. One would be the restriction of the carbohydrate intake. A second might be the elimination of the carbohydrate material from the tooth surfaces before it has an opportunity to be converted into the harmful substances. In other words, more adequate oral hygiene. A third method could be the introduction into the oral environs of what are known as enzyme inhibitors, because the bacteria do not ingest the carbohydrate material and secret acid. These bacteria elaborate enzymes and these enzymes outside the cellular bodies of the organisms are responsible for much of the fermentation of the carbohydrate material. So the possibility exists that if we can place something into the oral environment at the right time, which would be shortly after the ingestion of carbohydrate or along with it, these bacterial enzymes might not be able to convert the carbohydrate material into the acid state. This carbohydrate would be eliminated from the oral cavity through the chewing process, the loss in saliva, and so on. That is a possibility which is under consideration.

The fourth possibility is the development of a tooth tissue that is more resistant to the attack of the carious process. In other words, something that would render it less soluble to the acid that may develop.

A fifth method would be the development of anti-bacterial agents, something that could be taken into the mouth that would be effective over long periods of time and not be toxic to the individual, which would eliminate bacteria that are associated with or that are producing the caries condition.

A sixth method would be to neutralize the acids that are formed before they have an opportunity to destroy the enamel tissue.

These are various avenues of approach that are now under study, and I should like briefly to go over each one of them with you to sum up what we know and what we should learn about these various possibilities.

Carbohydrate Restriction

The first one we mentioned was carbohydrate restriction. I think there is abundant evidence to show the important association between carbohydrate consumption and caries activity. I think that is being more forcibly brought to our attention right now, with the surveys that are being made on prisoners of war, on individuals who have been living in war-ravaged areas, and on other individuals who have lived in famine-ridden communities for many years, where we see all states of malnutrition, and yet the incidence of decay in the mouths of these individuals, on their restricted diets, show less dental decay. The reason for this association, it would seem, is primarily because of the reduction of refined carbohydrates in the diets of these individuals.

Of course, a number of studies have been made in the United States and elsewhere, controlled studies, where the diets of individuals who were caries-susceptible have been regulated with a reduction in the caries process. A lot of work and, I think, a lot of credit should go to the University of Michigan on this score. You know that Dr. Jay and his associates at Michigan have developed diets which reduce carbohydrate considerably, down to the point where the diet will include

about a hundred grams of carbohydrate a day; yet these diets vary in their caloric content so that they can be prescribed for individuals of various ages and of various energy-requiring states. Those diets I understand are now available to the dentists of Illinois through our State Department of Health. They are printed in mimeographed form. The procedure, of course, is to place the individual on this restricted program for two weeks. At the end of this time a lactobacilli count is made and usually a drop in the count is found. Then for two weeks a small amount of whole wheat bread is permitted in the diet. If the bacterial count remains low or has dropped to the zero point, sugar is permitted in some form. It may be in dessert or it may be otherwise, but it should be taken with the meal and at only one meal of the day for the next two-week period, and then if the lactobacilli count remains low, the individual can go back on an unrestricted program.

In pursuing that program, where there has been good cooperation, reduction in caries activity has been reported.

I feel that one of the most effective ways of controlling this disease is through carbohydrate restriction; but we must realize how difficult it is going to be for us to obtain among the masses of the population the necessary restriction to control caries activity. The sweet tooth is so highly developed and carbohydrates are so palatable, so well advertised, and readily available that makes it almost impossible for us to reduce them in the diet to the point where we can check caries activity. I don't think that we could ever do it by legislation, although I understand that is being contemplated in some quarters. I think if we could not regulate the consumption of alcoholic beverages by the Eighteenth Amendment, it would be foolish for us to advocate any program of legislation which would restrict this damaging element, refined carbohydrate, in the diet.

I do sometimes wonder if it would not be wise for the dental profession to advocate some type of a tax on the manufacture or production of sweetened materials that are not foods. I can conceive of such a program developing a sizable sum of money which could be used to support caries research. It could be used to provide more facilities for training dental personnel, and it could even be used to provide for scholarships for individuals worthy of subsidy in dental educational programs. Think what it would mean if a penny tax were placed on a candy bar, a package of chewing gum, a bottle of soft drink. If there were a penny tax on all of that material that is consumed in the State of Illinois think of the sizable amount of money that could be raised and that could be used for caries control work and dental research studies by the State Department of Health, by the dental colleges in the state, and by other institutions and organizations that are working for the good of the public.

Then dentistry would not be having to go with its hat in its hand to various agencies and foundations, seeking money for its caries control programs. I think that it would then be much easier for us to conduct the type of programs that we want and should conduct for the public's benefit, for the benefit of dentistry, if some such type of legislation could be enacted. I can also visualize the tremendous lobby that would be developed against any such type of proposed legislation. But, win or lose, such a program, I think, would do good. It would do public good because of the attention it would focus on what is the most harmful element in the production of caries activity. The one that is the answer to the problem that astonished Mr. Richardson as he made clear here this morning—namely this increasing rate of caries activity.

Dr. Blayney, not so long ago, obtained information from the Department of Agriculture that it estimated the sugar consumption in this country during the next year will be between 135 and 140 pounds per person. This is a tremendous increase over what it used to be, and it seems to be going along hand-in-hand

with this increase in the caries incidence. This instance that Mr. Richardson cited this morning in the State of New York is no more nor less than what is being reported from other studies which show an increasing activity of dental caries in the past few decades despite the efforts that we have been making at dental health education and dental caries control.

So much for the possibility of regulating carbohydrate in the diet. I think it would be efficient if it could be practically applied. Recognizing the impracticality of reducing the carbohydrate intake, scientists are attempting to find ways and means of living with sugar without having it do the damage that it is apparently doing. We said that another method might be the elimination of the carbohydrate from the oral cavity before damage is done. There is good evidence that has been produced within the past few years to show that the caries attack is not a continuing thing, something that is going on at the same rate of activity twenty-four hours a day. There is good evidence that this acid production in caries-susceptible mouths and on the vulnerable areas of the teeth occurs within a few minutes after carbohydrate is taken into the mouth. Within five minutes or so there is a drop in hydrogen ion concentration, which means an increase in acidity on the tooth surface to the point where enamel can be dissolved, and within a half hour or so the maximum acid production has occured. Within an hour or two conditions are back to their original state. So the habit that we have been inculcating into the public of keeping their mouths clean by brushing their teeth the first thing in the morning and the last thing at night, while it is commendable for hygienic purposes and while it is stimulating, of course, to the gingival tissues, is not effective in reducing caries activity.

Oral hygiene programs for that purpose we believe should be performed immediately after the act of eating, within a few minutes—as soon as possible. The teeth should be brushed and the carbohydrate residue mechanically removed by brushing or flushing from the tooth surfaces. How effective such a program would be there is no available information. The conclusions of the workshop at Ann Arbor indicated, surprisingly enough, that for an act that is as commonly performed as tooth brushing there is no available evidence in the literature to indicate one way or another whether the act will help or will not help to reduce caries activity. So we believe that one area for further investigation, is an oral hygiene program which is conducted at a time when it is most likely to do good and in a manner that will be more thorough than is usually practiced by the average child. Thus, gaining information as to whether or not that means may be useful in reducing the caries attack rate.

Use of Enzyme Poisons

Now then, another method that we outlined earlier that is under study for caries control is the use of enzyme poisons and, of course, one of the agents that has received attention in the past few years has been synthetic vitamin K known as Menadione. It has been made available for study in chewing gum form, and there is evidence that if a gum containing this element is chewed shortly after eating—and, you see, there it is important to get this enzyme inhibitor into the mouth soon after the damaging material has been taken into the oral cavity —if this gum is taken into the oral cavity and chewed shortly after eating there is a reduction in caries activity. Unfortunately, the gum which was used as a control in this experiment had a high content of calcium carbonate and there was likewise a reduction in the caries activity in the mouths of the control subjects. However, not to the extent that was observed in the mouths using the Menadione, but there was a significant reduction in caries in the control group. But, the group reported was not large enough to be statistically significant and

the conclusions of the Michigan conference was that more work is necessary in this direction.

There is the bare possibility, of course, that such a substance might be toxic, and in any of these enzyme inhibitors that is a most important consideration. We must be sure that individuals taking this material, which they will be swallowing over a prolonged period of time, even though it is in small amounts, will suffer no accumulative effect which might be toxic to them.

Further research is being done seeking other elements than Menadione which can be placed right in the sugar bowl or which can be placed with the sugar and that is being used in the cooking of the food so that it will be consumed with the sugar and thus will inactivate the fermentation process. While such agents are still in the wishful-thinking stage, it will be fine if they can be discovered and if they can be used without toxicity to the individual.

Use of Fluorides

The fourth method that we mentioned as a possibility in caries control is the production of a tooth tissue more resistant to the attack of the carious process. The element of this type that is receiving major attention is fluorine, because it has been observed that where fluorides occur in the drinking water in concentration above 1 part per million there is significantly less dental decay. One of the few positive conclusions that came from the Michigan conference was the approval of 2 per cent sodium fluoride solution applied topically to the tooth tissues to reduce caries activity. There is sufficient evidence now accumulated to indicate that topical application of fluorides will be effective in reducing the decay process about 40 per cent. But it is emphasized that no predictions should be made for an individual case. A patient must not be told that if this material is applied to his teeth, it is going to reduce decay in his mouth about 40 per cent. There is an individual variation that results from the use of this material. Some individuals will show more than a 40 per cent reduction, and some apparently have very little improvement in their caries condition following its application, but the over-all picture indicates about a 40 per cent reduction in the decay process.

Fluorides, perhaps, act in several ways. There is the possibility that the fluorine ion is an enzyme poison. There is some meager evidence that it also has bacterial inhibition. The big factor in its development of caries resistance apparently is in the production of a tooth tissue that is less soluble in acid. Fluorine has an affinity for calcified tissue, and as it comes in contact with enamel supposedly it changes the normal enamel tissue which is chemically known as hydroxyapatite into a fluorapatite which has a solubility rate of about one half that of normal enamel. So there is a possibility of using the fluorine ion to reduce the solubility of the tooth tissue.

The fluorine ion is being used in drinking water, and there are some very well controlled studies now being done under competent supervision to determine the effectiveness of the artificial addition of fluorides to the drinking water. I think that until the results from these studies are obtained as to the possible helpfulness and harmfulness of fluorine artificially added to the water supply—until we have more evidence available from these well controlled studies, I don't believe that such a method should be used widely. I think the communities that are not now participating in the scientific studies underway should withstand any pressure that might be put on them to place fluorine ion in their drinking water. We now wait until we know more about this element is going to do when it is artificially used.

Still another agent that has been used to produce a resistance in the tooth tissue to caries is silver nitrate. The conclusions of the Ann Arbor conference indicate that there is no good evidence for or against the use of silver nitrate in the reduction of the disease despite the wide-

spread use that has been made of it. There has been no accumulation of data that can be analyzed statistically to show how effective this material may be. There is definite evidence that the silver ion will produce a change in both the organic and inorganic content of tooth tissue, but how effective that will be in retarding caries activity is still an unknown quantity.

There is another method that is being advocated which I think would come under this classification. That is the material that is being recommended by Dr. Gottlieb and his associates, the purpose of which, as I understand it, is to block the organic pathways in the tooth by precipitating the organic material on the surface of the enamel and in the enamel lamellae and tufts. These are invasion inroads, as he terms them, by which the caries process enters the tooth tissue. He is precipitating this organic material by the use of a 40 per cent zinc chloride solution followed by a 20 per cent potassium ferrocyanide solution. He includes in the treatment the use of a wetting agent known as Naccanol. The wetting agent is to make the enamel surface more penetrable for the zinc chloride solution. The evidence that has been presented up to now by Gottlieb's group is not sufficient to permit an evaluation of the clinical effectiveness of these materials in caries control.

Use of Anti-Bacterial Agents

Still another method that is being put to a test to determine what possible effectiveness it may have on caries reduction is the use of anti-bacterial agents. It is in this field that we have been particularly interested. We became interested because of the fact that there is apparently a resistance to certain types of bacteria, particularly the Lactobacillus acidophilus, in mouths of individuals who are naturally immune or resistant to dental caries. These organisms do not appear in those mouths to any great extent nor can they be implanted into those mouths. The laboratory studies that we conducted to determine why these individuals had this resistance to this particular organism indicated that they produced ammonia from their salivas at a more rapid rate than did individuals who are caries-susceptible, and the laboratory work also indicated that the lactobacillus and other associated aciduric organisms are susceptible to inhibition or inactivation by ammonia and it is not because of the alkalinity that the ammonia produces. It is specifically the ammonia radical itself but the reason for it is obscure.

We do not contend that the lactobacilli are necessarily established as the causative agent of dental caries, but we do believe that there is abundant evidence to show the association between lactobacillus and caries activity, and that association is so well established that many state health laboratories, including our own, are now accepting salivary specimens from dentists on which they will do lactobacilli counts and report back to the dentist on the number of those organisms present in the specimen of saliva submitted. There is wide recognition accorded to the association of this particular organism and caries. The fact that it is correlated with caries activity does not necessarily prove that it is a causative agent, but we believe that if we can provide an environment in which these lactobacilli will not survive we have perhaps created an environment which is no longer productive of caries.

Use of Ammonia Salts

We have experimented with different ammonia salts to determine which might be most effective in clinical use and we have compounded dentifrices and mouth rinses on that basis. We have subjected a small group of students to a two-year clinical study and we have been encouraged by the results but the work has not progressed nearly far enough clinically for us to make any conclusions or any definite statement as to how effective

this method is going to be in the clinical control of dental caries. We have recently been given an appropriation which will let us take this study into grade schools, where we can use the material on a sufficiently large group ,of children and have them adequately controlled through a two-year test. At the end of that time we will know more about the clinical effectiveness of such a program in controlling caries activity.

Penicillin

There is another anti-bacterial agent that is now under study which also holds promise and that is penicillin. Work is being done at Western Reserve University which shows a reduction in lactobacilli counts in clinical studies that are being made with dental students, but here again the amount of evidence, the number of students used, and so on, is not sufficient to be significant, and further clinical and laboratory studies must be conducted before we will know the possibilities of penicillin used in dentifrice form.

I might go back and say that the fluorides have also been advocated in a dentifrice. They have also been advocated in bone meal, in lozenge and in tablet form for controlling decay activity, but the conclusions of the Ann Arbor conference were that there was no valid evidence to show that fluorides in any form other than the solution applied topically and their natural presence in the drinking water are effective in controlling decay activity.

The sixth factor that I mentioned as having a possible regulating effect on caries activity was the neutralization of the acid before it had an opportunity to attack the tooth tissues and that ties into the work, to a certain extent, that we have been doing. The element that we have been using in this regard is urea. I believe it was first used by Dr. Stephan. Urea is rapidly converted in the mouths of most individuals to ammonium carbonate, which is alkaline in character, and this ammonium carbonate not only has an inhibiting effect on bacterial activity but also has a neutralizing effect on acid. At a midwinter meeting of the Chicago Dental Society two years ago, Dr. Stephan read a paper, which I do not believe was ever published, on the use of a urea-containing dentifrice, which was used by a group of over one hundred individuals for a two-year period. There appeared to be about a 60 per cent reduction in caries activity in these individuals and he was at the time of the opinion that it was because of the neutralizing effect of the ammonia on the acids that might be developing in the mouth and were responsible for caries activity.

Our time is up. I have tried to give you a rapid resumé of what is being done in the field of caries control and the information that is available to date to make it either fact or fancy. If you are particularly interested in the topical application of fluoride, which, as I said, is the one thing that came out of the Ann Arbor conference as being something that could be safely and effectively used, it was reported there that from four to six applications are the optimal number of applications to get this 40 per cent reduction in caries activity. More applications were not effective in further reducing caries activity. The first application should be proceeded by a careful prophylaxis to get the maximum effect of this material. Other fluoride preparations have been tried, but none have been found to be superior to the sodium fluoride solution.

DENTAL NEEDS AND DENTAL MANPOWER IN ILLINOIS

Lon W. Morrey, D.D.S.,*

In order to establish a dental health program, either on a community level or a state level, basic data should first be obtained regarding dental needs and dental personnel. Those who plan the program should be fully informed regarding the dental needs of both children and adults, and regarding the personnel and facilities available to cope with those needs.

Unfortunately few informative studies have been made on the dental needs of adults in Illinois. Several studies have been made which provide fairly accurate information on the dental needs of children. Two of these studies were conducted within the past seven years by the Dental Division of the State Department of Public Health. Another study was made in Chicago and Cook County about a year ago.

I have taken the liberty of quoting freely from the reports of these three surveys as their combined statistics appear to give a fairly accurate picture of the dental needs of Illinois children.

Illinois State Survey[1]

In 1942 the Dental Division of the Illinois State Department of Public Health completed a report on a survey of 148,881 school children located in 92 counties, exclusive of Chicago. The examinations were made by five well-trained staff dentists. Mouth mirrors and explorers were used and the rooms in which the examinations were conducted were well lighted. According to this report, the 11,188 six-year old children included in the survey had a D.M.F. rate of 4.78 for deciduous teeth and 0.41 for permanent teeth, making a total of 5.19 decayed, missing or filled teeth per six-year old child. The 12,123 nine-year old children averaged 3.80 D.M.F. deciduous teeth and 2.03 D.M.F. permanent teeth, a total of 5.83 per child. The 12,413 twelve-year old children averaged 0.55 D.M.F. deciduous teeth and 3.40 D.M.F. permanent teeth, a total of 3.95 per child. The 4,743 sixteen-year old children had 0.01 D.M.F. deciduous teeth and 5.61 D.M.F. permanent teeth, a total of 5.62 per child.

The total number of decayed, filled or missing teeth for these age groups was 58,025 for the 11,188 six-year old children, 70,737 for the 12,123 nine-year olds, 49,052 for the 12,413 twelve-year olds, and 26,667 for the 4,743 sixteen-years olds. The 117,369 children included in this study, ranging from 5 to 16 years of age, had a total of 590,235 decayed, missing or filled teeth, or an average of 5 plus per child.

Logan County Survey[2]

In 1941-1942 the personnel of the Dental Division of the Illinois State Department of Public Health examined the teeth of 4,323 white school children in Logan County. This county is located in the exact center of the state and in many respects can be considered as representing a typical rural community in Illinois. The children were divided into three categories: (1) those whose parents could afford to provide them with dental care; (2) those whose parents could afford to

*Editor, The Journal of the American Dental Association.

1. Dental Caries Experience of 148,881 Preschool, Elementary and High School Children in the State of Illinois, 1944. Illinois State Department of Public Health. (Unpublished Material.)

2. Deatherage, Chas. F., A Study of Dental Caries Experience in 4,323 white Illinois School Children Living in Logan County (Illinois). (Unpublished Material.)

provide them with partial dental care; and (3) those whose parents could not afford to provide them with any dental care. The children were classified by the two county nurses, the superintendent of schools, and the school teachers, who knew the families and could determine their economic status.

The report of the Logan County Survey indicated that the six to eight-year old children in the highest economic group showed a definite lack of dental care. 78.4 per cent of the boys and 84.1 per cent of the girls in this group were in need of dental attention. The teeth of the fifteen to seventeen-year old children in the highest economic group appeared to be in somewhat better condition. In this group, 60.2 per cent of the boys and only 42.9 per cent of the girls needed dental attention. Of the 2,855 children classified in group 1, 1,817 or 63.6 per cent, needed dental care. These children had 4,275 untreated carious permanent teeth and 4,180 untreated carious deciduous teeth, a total of 8,455 untreated carious teeth, or an average of 2.96 per child.

Of the 863 children who were classified in group 2 (those whose parents could afford to furnish them with partial dental care), 704, or 81.6 per cent, were in need of dental attention. These children had 2,160 untreated caries permanent teeth and 1,504 untreated carious deciduous teeth, a total of 3,664 teeth that needed filling or extraction, an average of 4.25 per child. The 863 children in this group had a total of 507 filled permanent teeth and 33 filled deciduous teeth, an average of 0.63 filled teeth per child.

Of the 605 children in group 3 (those whose parents could not afford dental care), 523, or 86.4 per cent, needed dental attention. The 605 children had 1,545 untreated carious permanent teeth and 1,370 untreated carious deciduous teeth. The total number of teeth needing attention was 2,915 or 4.82 teeth per child. These children had very few filled teeth, only 158 filled permanent teeth and 18 filled deciduous teeth.

At the time this study was made the economic status of the families was evaluated as follows: the families of 14 per cent of the children were unable to afford dental care, the families of 20 per cent could afford partial dental care, and the families of 66 per cent could afford complete care.

Chicago and Cook County Survey[3]

In 1946 a dental survey was made in Chicago of 13,444 white and 3,780 Negro school children. The children were classified into three groups, according to the socio-economic areas in which they lived. These areas were based on census community areas and rental levels for 1940, the last year for which such information was available.

According to the report of this survey, 6.1 per cent of the six-year old children in the high economic areas had one or more D.M.F. permanent teeth, 5.6 per cent of the six-year old children in the medium economic area had one or more D.M.F. permanent teeth and 15.1 per cent of the six-year olds in the low economic area had one or more D.M.F. permanent teeth. In the twelve-year old group, 87.7 per cent of the children in the high economic area had one or more D.M.F. permanent teeth as compared to 93.4 per cent for those in the medium areas and 90.5 per cent for those in the low economic areas. Approximately the same percentage of eighteen-year olds in all three areas had one or more D.M.F. teeth; 98.7 per cent in the high, 98.9 per cent in the medium and 98.5 per cent in the low economic area.

Chicago Negro children appeared to have better teeth than white children in the same area, 8.7 per cent of the six-year old Negro children, 70.4 per cent of the twelve-year olds, and 80.5 per cent of the eighteen-year olds had one or more decayed, missing or filled teeth. The dental caries rate for nine-year old white children was nearly 40 per cent above the rate for Negro children of the same age. This differential decreased, how-

3. Kroschel, Wm. P., and Hawkins, James, Chicago-Cook County Health Survey Report on Dental Health, 1946. (Unpublished Material.)

ever, as the children grew older. At age eighteen the dental caries for white children was 23 per cent higher than for Negro children.

According to the survey the annual increment of dental caries among Chicago white children is 0.7 teeth per child per year. The survey disclosed that Chicago school children received some dental service, but it presented no evidence regarding the adequacy of the service. 3.2 per cent of the six-year old children living in the high economic area had one or more filled permanent teeth, 2.5 per cent of the six-year old children in the medium economic area had one or more filled permanent teeth, and 4.2 per cent of the children in this age group in the low economic area had one or more filled permanent teeth. The fact that almost twice as many poor children had received dental care may be attributed to the accessibility of school dental clinics. In the twelve-year old group, 74.6 per cent of the children in the high economic level and 72.5 per cent of those in the medium economic area had one or more filled permanent teeth, whereas only 58.3 per cent of the twelve-year olds in the low economic area had received this type of service. In the eighteen-year old group approximately 95 per cent of the children in the high economic area, 85 per cent of those in the medium economic area, and 92 per cent of those in the low economic area had received some restorative dental service.

The dental needs of the Negro children of Chicago apparently were less well met. 1.5 per cent of the six-year old Negro children, 23.3 per cent of the twelve-year olds, and 51.2 per cent of the eighteen-year old children had one or more filled permanent teeth.

The report states, "In general, for the total white children surveyed in Chicago schools, approximately 30 per cent of those with one or more D.M.F. teeth showed no evidence of dental care in the form of fillings in the permanent teeth, while for the Negro group, approximately 70 per cent of the children with D.M.F. teeth show a lack of dental care in the form of fillings."

One of the accepted methods of determining dental needs in a community is by ascertaining the tooth mortality rate. Twelve-year old Chicago white children living in the high economic area had a tooth mortality rate of .463, almost one-half a tooth per child. Twelve-year olds in the medium economic area had a tooth mortality rate of .786, over three-fourths of a tooth per child. Those living in the low economic area had a tooth mortality rate of .960 per child.

In the eighteen-year old group, children living in the high economic area had a tooth mortality rate of 2.030. The Chicago Negro children fared considerably better. The tooth mortality rate for the twelve-year old Negro children was .690 and for the eighteen-year old Negro children, 1.220.

I want to pay my respects both to Dr. Kroschel and to Dr. Hawkins, who were responsible for making this survey and who were responsible for tabulating the findings.

These data, compiled from a statewide survey, a county survey and a survey made in the largest metropolitan area in the state, indicate that the dental needs of Illinois children are not being met, nor will these needs be met under present conditions and with existing personnel.

Before discussing personnel, however, it might be interesting to speculate on national dental needs.

Studies[4] indicate that American children between six and eighteen years of age require approximately 244,000,000 fillings to place their mouths in a healthy condition and that once this backlog of accumulated need is met, dentists would have to insert an additional 33,000,000 fillings per year in order to fill the annual increment of cavities of the six to eighteen-year olds. Cavities develop in children's teeth at a constant rate. This rate has been determined[5] as one carious tooth every sixteen months, or three-

4. Committee reports of the Institute of Dental Health Economics, June 26-July 1, 1944. The School of Public Health, University of Michigan.

5. Survey of the Dental Needs of Grade School Children of Hagerstown, Md., 1937. U.S.P.H.S. Bulletin.

quarters of a tooth per year. A mouth mirror and explorer examination[6] recently made of 614 preschool white children in Chicago indicated that the two-year old children averaged 0.4 cavities; three-year olds, 1.7; four-year olds, 3.5, and 5-year olds, 3 cavities. By eighteen years of age, children average nine cavities.

The Children's Fund of Michigan[7] reports that Michigan children between six and sixteen years of age require, on the average, seven fillings and 1.7 extractions.

Among adults[7] of all ages there is an average need for 4.5 fillings and more than two extractions. Approximately 1 out of every 4 adults needs one or more bridges while one out of exery six requires full dentures.

If we apply these national estimates locally we find that the 1,161,039 children in Illinois between the ages of five and fourteen require approximately 8,127,000 fillings and 1,974,000 extractions. They experience 870,779 new cavities each year. 5,381,944 adults in Illinois require 24,222,000 fillings, 10,764 extractions, 1,345,486 bridges and 896,990 dentures.

If we apply the national estimates to Chicago we find that Chicago's 456,910 children between five and fourteen years of age require 3,198,370 fillings and 776,747 extractions. They experience 342,682 new cavities per year. Chicago's 2,397,382 adults require approximately 10,688,000 fillings, 4,795,000 extractions, 600,000 bridges, and 400,000 dentures. Springfield's 9,952 children between the ages of five and fourteen require approximately 7,000 fillings and 17,000 extractions. Springfield's 53,000 adults require approximately 240,000 fillings, 100,000 extractions, 1,300 bridges, and 8,881 dentures.

These figures, of course, are speculative. They were arrived at by applying national estimates to our state and local communities. They serve no purpose other than to generalize on the unmet dental needs in Illinois. It is obvious that there are not enough dentists in the state to care for this enormous backlog of unmet needs.

Dental Personnel

In 1946 the Committee on Economics published a revised report concerning the distribution of dentists by counties in forty-four states and the District of Columbia. The original report was published in 1944.

Because Illinois does not have annual or bi-annual registration of dentists the committee obtained the basic information on Illinois from the files of the Illinois State Dental Society.

Within the past thirty days the American Dental Association has published its new directory which lists dentists by communities. As Mr. Bagdonas, Secretary of the Committee on Economics of the American Dental Association, points out, however, in an unpublished article entitled, "The Use of the Dental Directory in Evaluating Professional Resources,"[8] information regarding the distribution of dentists by counties or communities does not present a true picture of dental resources. According to the study now being compiled by Mr. Bagdonas the population of Illinois in 1940 was 7,877,000. There are 6,116 dentists licensed to practice in the state, or 7.74 dentists per 10,000 population, a ratio of approximately 1:1,300. How far the services of these dentists may be extended geographically is a matter for conjecture.

Illinois is fortunate in having an abundance of good highways and good transportation. Consequently county lines do not constitute a barrier to those seeking dental service within a few miles of their residences. They now may travel long distances to obtain dental care. As part of its current study of dental personnel in Illinois,[8] the Committee on Economics assumed that areas within a twenty-mile

6. Report of Dental Survey of 614 Nursery School Children, 1947 (Chicago). Salvation Army Dental Clinic. (Unpublished Material.)

7. Hearings Before a Subcommittee of the Committee on Education and Labor, U. S. Senate, Seventy-ninth Congress, First Session, on S.190 and S.1099, p. 74. Washington, D. C. Government Printing Office.

8. Use of the Dental Directory in Evaluating Professional Resources: Availability of Dental Service. Committee on Economics, American Dental Association.

Table 1.—Distribution of Population and Dentists by Major Areas in Illinois—1947

Area	Number of Counties	Population 1947 (Rounded)	Number of Dentists	Dentists per 10,000 Population
Total	102	8,025,300	6,116	7.62
1	9	366,600	214	5.83
2	8	4,855,400	4,548	9.36
3	13	477,000	244	5.11
4	15	713,400	412	5.77
5	6	151,600	67	4.41
6	15	396,800	196	4.93
7	9	515,900	237	4.59
8	12	238,800	84	3.51
9	15	309,800	114	3.67

radius of each "service center" would be a reasonable distance for rural families to travel in order to obtain dental service. On the basis of this assumption the committee estimates that over 90 per cent of the total population of the state need to travel no more than twenty miles to secure dental service. This does not imply that there is a sufficient number of dentists in each service area to take care of the dental needs of those within each area. It simply means that over 90 per cent of the population is within easy distance of emergency dental care, although those living in some service areas may not be able to receive complete dental care because of insufficient dental personnel.

Approximately 90 per cent of the population are within twenty miles of dental service. There are a few areas where this does not apply, particularly along the western border of the state. There is a large area there where people must travel more than twenty miles to receive dental care. There are spotted areas in between where these service areas do not overlap, but on the whole the distribution of dentists in Illinois is quite even.

In a further study of distribution of dentists in the state the Committee on Economics grouped certain counties as logically as possible around one or more major service centers, taking into consideration the distance to competing trade centers. This method of grouping resulted in the state being divided into nine major trade areas. These are shown in table 1. Area 1 is comprised of the northwest section of the state and includes Rockford and Dixon. It has a population of 366,000 and has 214 dentists, or 5.83 dentists per 10,000 population. Area 2 has a population of 4,855,000 and 4,548 dentists, about 9.36 dentists per 10,000 population. Chicago, Joliet and the cities along the north shore are included in this area. Area 3, extending from Ottawa on the east to Rock Island on the west, has a population of 477,000 and 244 dentists—5.11 dentists per 10,000 population. Area 4, in the center of the state, includes Peoria, Bloomington, Springfield and Decatur. It has a population of 713,000 and 412 dentists—5.77 dentists per 10,000 population. Area 5, along the western border of the state, of which Quincy is the principal trade center, has a population of 151,600 and 67 dentists—4.41 dentists per 10,000 population. Area 6, along the eastern border, includes Champaign, Danville and Mattoon. It has a population of 396,800 and 196 dentists—about 4.93 dentists per 10,000 people. Area 7, of which East St. Louis is the principal trade center, has a population of about 516,000 and 237 dentists—4.59 dentists per 10,000 popula-

tion. Area 8, in the southeastern section of the state, has a population of 238,000 and only 84 dentists—3.51 per 10,000 people. Area 9, at the extreme southern tip of the state, has about 310,000 population and 114 dentists—3.67 dentists per 10,000 population.

This analysis indicates that significant differences exist in the distribution of dentists in the state. The Chicago metropolitan area has slightly over nine dentists per 10,000 population in contrast to areas 8 and 9 in the southern section which has slightly more than 3.5 dentists for each 10,000 population. The ratio of dentists to population in the other six areas of the state is fairly uniform as they run from 4.5 to 6 dentists per 10,000 people.

Distribution of Dentists in Chicago and Cook County

As is well known, the distribution of dentists in the Chicago metropolitan area is not uniform. According to the recent Chicago-Cook County Health Survey[3] there are about 864,000 people living in Chicago's high economic area. There are 904 dentists practicing in this area, a ratio of 1:955. In the medium economic area there are 816 dentists and a population of a little over 1,000,000, a ratio of 1:1,325. In the low economic area there are 835 dentists and almost 1,500,000 people, a ratio of 1:1,1731. In Cook County, exclusive of Chicago, there are about 525 dentists and a population of 655,534, or a dentist population ratio of 1:1,268.

Ancillary Personnel

A report of dental personnel is not complete unless it includes some mention of ancillary services.

Since Illinois has but recently passed a dental hygienist law there are few dental hygienists practicing within the state. I just learned last night that there are about 40 dental hygienists who have passed the examinations which have been held, so there are very few. It is, therefore, felt that their aid in increasing dental service in this state will be negligible for several years to come.

No studies have been made regarding the number and distribution of dental assistants in Illinois. If the national estimates[9] regarding assistants are applied to this state it may be assumed that there are about 3,000 assistants now being employed in dental offices in Illinois—one assistant for every two dentists.

No recent study has been made, to my knowledge, of the number of technicians employed within the state. Even though these data were available they would be unimportant. County and state boundaries have no influence on the relationship between dental laboratories and technicians and dentists. Here again the national estimates[10] of one dental technician to every four dentists may be applied to Illinois, though all these technicians or the laboratories in which they work may not be located within the state.

Conclusion

Evidence has been presented to indicate that the dental needs of Illinois children are not being met. In fact, it is doubtful that the demands for dentistry for children has been met during the past five years or more. Evidence has also been presented to indicate that while there is a wide distribution of dentists in the state, the distribution is by no means uniform. Communities that wish to develop a more satisfactory dental health program must first make a thorough survey of their dental needs and dental resources.

9. Klein, Henry. Civilian Dentistry in War Time. *J.A.D.A.* 31:648 (May 1) 1944.
10. Morrey, Lon W., Dental Personnel. *J.A.D.A.* 32:131 (February) 1945.

ABILITY TO PAY FOR DENTAL CARE

David Lindstrom, Ph.D.*

It is true that the rural areas of America are not adequately served with medical and dental care, and much of the data that I have here will relate to rural areas because that is the source to which I go for data.

The shock which one gets when an otherwise attractive person opens his mouth and shows malformed or decayed teeth is not pleasant. When one finds a majority of our youth with such conditions, it becomes a matter of grave concern. We made a study in Polk County, Illinois, some time ago, and one of the things that our workers came back saying was that there were many good looking girls with terrible looking teeth. I don't know why they looked at them in the girls particularly, but that is what they said. We are told that malformed, decayed, or lost teeth come as a result of lack of proper dental care and diet, especially in youth. Such care should include regular visits to the dentist and, of course, such visits cost money. The fact that 71 per cent of all village families in the middle Atlantic and North Central regions of the United States included in the Consumer Purchases Study of the United States Department of Agriculture, published in 1941, incurred no dental bills, indicates either that they thought they did not need such care or that they could not afford it. The study reports that even in the income classes above $2,000 more than one-fifth of the families had no expenditures for dental care; only 14 per cent of those in the class of $250-$499 made outlays for care of teeth.[1] This was before World War II. I would say the situation is not much different today.

An earlier study by the Committee on the Costs of Medical Care[2] came to the conclusion that adequate dental care could then be obtained only at a price beyond the reach of at least one-half of the population. More recently a study made in 1941 by the Bureau of Human Nutrition and Home Economics of the United States Department of Agriculture showed that farm families of low incomes ($250 to $500) spent about the same proportion of their medical dollar for dental care as those with incomes from $2,000 to $3,000, but that in each case it was not much more than 10 per cent of the total dollar spent for physicians' care, dental care, eye care, hospital care, medicines and drugs, and other medical needs.[3] All of these are documented and you can find the sources of the data. The Reed study showed the cost per family in ten states should be $44 for adequate dental care in 1929. This is less than half of what it would be today. Studies of actual farm family expenditures for medical care in Illinois, for example, showed that the total was $63 per family in 1930, dropping to a low of $41 in 1932, 1937, and 1938, and increasing to $131 in 1946.[4] The 1946 figure was more than twice as high as the 1930 figure; without question costs for dental care increased in similar proportions.

The United States Department of Agriculture study showed that all middle

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1. "Family Expenditures for Medical Care." Washington: U.S.D.A. Misc. Pub. No. 402, 1941, p. 20.

2. Reed, Louis S., "The Ability to Pay for Medical Care." Washington: The Committee on the Costs of Medical Care, 910 Seventeenth Street, N.W., June, 1933.

3. "What Farm Families Spend for Medical Care." Washington: U.S.D.A. Misc. Pub. 561, 1942, p. 6.

4. Freeman, Ruth Crawford and Crouch, Irene, "Past Experiences Key to Future Planning." Urbana: Extension Service in Agriculture and Home Economics, HEE3409, 1947.

income farm families spent an average of but $8; that those who had dental expense spent about $20. Note the difference. You see what happens to average figures when you take out those who do not spend for dental care. This study showed, too, that those spending the *least* for medical care spent less than half as much for dental care as those spending *most* for medical care. Which would indicate possibly that those who spend most for medical care probably spend twice as much for dental care. Furthermore, middle income farm families spent a larger share of their medical dollar for dental care than did village families but somewhat a smaller share than did urban families. They spent more for physician's care, medicine and drugs, and eye care than did families in towns and cities.

If we assume that dental care costs are 10 per cent of the total medical care costs, then the Illinois farm families spent only $6.30 per year in 1946 for dental care. The low income families $1,000 to $1,499) spent $3.10, compared with $25.90 for the high income group ($3,000 and over.) If, as was shown by the Reed study, $44 should have been spent by a family for adequate dental care in 1929, then it would have risen at least to $80 in 1946. Thus the farm families in the highest income group (*$3,000 and over) in Illinois spent less than a third as much as was needed for adequate dental care in 1946. The low income groups spent less than 5 per cent as much as needed for adequate care.

So that farm families and village families spent a smaller proportion of their medical dollars for dental care than did urban families, which indicates to me that there is a problem here in education.

The U. S. Department of Agriculture study compares expenditures for medical care for farm, village, and city families for the various income groups. The amount spent for medical care was about $30 for farm and $25 for village, town and city families with incomes under $500. If you say that dental care is 10 per cent of that, then it is $3 for farm and $2.50 for village and town and city families. Farm families in every income group except those receiving $3,000 to $5,000 spent more, though only a few dollars, than did the other types of families. Hence what is expended by farm families in income groups under $3,000 is about the same as for similar income groups in villages, towns, and cities. In other words, there isn't much difference in the actual amount spent by farm families and town and city families in the same income groups. However, we must recognize that in 1941 more than half of all farm families had incomes of less than $1,000, whereas fewer than half of the village and only a fourth of the town and city families had incomes lower than $1,000. The point is, you see, that almost twice as many people in rural areas have low incomes as in urban areas. Even as late as 1945 one-third of the farm families had incomes of less than $500.[5] This is according to an article in Fortune Magazine, and I haven't been able to discover where Fortune Magazine got its data.

In 1941 only 40 per cent of the farm families purchased dental care; and only 50 per cent of the village, town, and city families purchased dental care, according to the USDA study.

That cost of medical (including dental) care was a deterrent to securing adequate care was shown by a Virginia study; 86 per cent of 565 families spent an average of $65; 15 per cent spent an average of $100. The yearly cost of medical and dental care in 1937 was computed to be at least $112 per family under the most efficient means of preparing for medical costs and providing medical services; in 1947 it would probably be not less than $200; hence many families in Virginia feel that high costs prevent them from obtaining all the medical and dental care needed.[6] What their testimony is worth you can judge for yourself as well as I.

The need for dental care is greater, it

5. "The Farmer Goes to Town." Fortune Magazine, Vol. 36. No. 4, p. 89.

6. Tate, Leland B., "The Health and Medical Care Situation in Rural Virginia." Blacksburg: V.P.I. Bull. 383, 1944.

seems, than can be taken care of, because there are not enough facilities or because people feel they cannot afford the cost. The Virginia study cited above showed that nearly 90 per cent of 51,000 children examined had defective teeth, regardless of race or residence. Defective teeth was a major cause for rejection by selective service boards in World War II. A report of results from health examinations of school children in a suburb south of Chicago in 1947 showed eight out of ten children with defective teeth. I noticed in Look Magazine's current issue an interesting discussion of dental and medical care, indicating that 85 per cent of the youth examined had defective teeth.

A Missouri study showed that almost two-thirds of the male population among 4,131 Farm Security Administration clients of southeastern Missouri did not possess a full set of teeth; over one-third aged 15 to 24 had missing teeth.[7] Moreover, 45.3 per cent of 970 males examined possessed one or more dental caries; half the males under 45 years of age had dental caries. More than one-third had diseases of the gums; 55.4 per cent over 45 years of age had diseased gums. A recent (1946) Michigan study of symptoms reported by 1,219 farm families showed that the most frequent symptom was toothache, accounting for 10.4 per cent of all symptoms reported.[8] The highest per cent (68) reporting symptoms were in the low income (under $1,000) group, yet 38.9 per cent of those receiving incomes over $3,500 reported symptoms.

What can we conclude from the above? Without question, many people, especially those in the low income groups, do not get adequate dental care. An alarmingly high percentage of our children have defective teeth. Probably a third of the youth in middle and low income families have already lost some teeth; probably half of those over 45 years of age have missing teeth; more than half have dental caries or diseased gums. Would there be these large proportions if our children, youth, and adults were getting adequate dental care?

The cost of adequate dental care seems to be prohibitive to many people. Even those in good financial circumstances spend only one-fourth as much as they should for adequate dental care; those in the lowest income brackets spend only 5 per cent as much as they should.

Dental care is a thing that can be neglected in favor of more pressing needs; a doctor's call or the need for hospital care will take precedence over the adequate care of teeth. Even toothache, which is a symptom of advanced tooth decay, will be assuaged by some form of home medication rather than for the person to incur the cost of a filling or extraction. The number who put off dental care until the need presses hard, though probably decreasing, is still very large. I wouldn't attempt to give you a figure, but I would say the majority of our people put off dental care until the need is pressing, especially in rural areas. The feeling of lack of means to pay the immediate cost is without question a major deterrent to seeking adequate dental care.

Professional dental care as a last resort is still far too prevalent. The cost of dental care could be cut considerably were people brought to accept regular dental examinations and to be willing to get corrections made as soon as defects are found. The present Illinois program for providing regular physical and dental examinations for school children is, therefore, an excellent program and should have professional and community support. The programs need to be conducted (1) so as to detect all defects early in the life of the child; (2) to induce parents to get defects corrected as soon as they are discovered; and (3) to make a practice of securing regular dental examinations. Thus the cost for dental care can be kept down so that most families can afford the service; prevention is far less costly than cure. Doubtless

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7. C. E. Lively and Herbert F. Lionberger, "The Physical Status and Health of Farm Tenants and Farm Laborers in Southeast Missouri." Columbia: Mo. Agr. Exp. Sta., Preliminary Report No. 2, 1942.

8. Charles R. Hoffer, "Medical Needs of the Rural Population in Michigan." Rur. Soc., Vol. 12, No. 2, June 1946, p. 164.

there will be some for whom the costs will continue to be prohibitive. We should, therefore, keep an open mind relative to and study the merits of group and tax supported dental and medical care plans.

EXISTING DENTAL HEALTH PROGRAMS IN ILLINOIS

John E. Chrietzberg, D.D.S., M.P.H.*

In this discussion I will attempt to give some idea of the existing dental programs in Illinois. No effort will be made to discuss in detail individual programs outside of the Health Department programs and those coordinating with our Division.

I have attempted to place dental services or programs in one of three groups: Local community, state and federal programs.

In the local communities we know that the private dentists are providing the greatest amount of care to individuals in their own offices. In addition to the dentist's private practice we have numerous school programs providing educational service. A limited number are offering remedial care to small groups of underprivileged children. We also have local health department programs in a small number of places. They are providing some education, preventive and remedial care to a small group of children.

The state has five official agencies, either operating a dental program from the state level or assisting local counties in operating their own. They are the Public Aid Commission, Department of Public Welfare, Crippled Children's Service, Vocational Rehabilitation Service, and the Department of Public Health. All of these agencies combined are rendering only a small amount of remedial service with some educational service to the total population of Illinois. There is little or no coordination of these programs and there is a potential danger of greatly overlapping of service in any expanded program by any one of these agencies with the possible exception of Public Welfare which confines its activities to institutions.

Federal agencies are of little concern as far as the actual operation of a program is concerned. However, one of the largest organized programs in the state is the Veterans Administration with almost complete cooperation and approval of the dental profession. The Children's Bureau and the Public Health Service are aiding financially in many of the existing state and local programs.

All together these various agencies and the dental profession combined, with the exception of the Veterans Administration, were providing less than 25 per cent of the needed dental care for children, according to our latest surveys. We have no statistical information concerning the adult population except that of the selective service reports which show that a deplorable condition exists in young adults. From these reports, little, if any better, conditions exist than those found in the children.

Local Programs

Most of the local school programs are designed and developed in the urban areas with few programs planned for the rural children; even the educational phase is absent here. These programs vary in their functions; they have little uniformity or similarity and there is little or no coordination with the out-

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side agencies. There is no way of scientifically evaluating the results of these programs. Most of those reporting to our Division use their own forms which cannot be correlated with any standard forms that we have or may design. Many of the remedial programs provide only emergency treatment which is relief rather than public health. Some limit their services to the permanent teeth with little or no regard for the primary teeth.

State Program

Four of the five state programs are interested in remedial care for specific groups, such as inmates of institutions; crippled children who receive oral surgery and orthodontic treatment; rehabilitation of groups for employment; those totally on relief; those who are classified as dependent children; the blind and old age pensioners. Two of these programs have a potential possibility of expansion to provide care for large groups. In the vocational rehabilitation program and public aid commission's program, there are large groups that may be considered potential recipients. If the crippled children's program were to include service for minor oral defects it, too, could expand greatly. Of these four agencies, only Public Welfare has a dentist supervising its program. The others are either under medical supervision or lay personnel.

Illinois Public Health Dental Program

This program is relatively young with great possibilities for expansion, but with few well developed activities at present. From the recommendations of this meeting we would like to gradually expand this program to the desired limits in order to improve all of our programs.

The principal objective, which we never hope to reach in our lifetime, is to see that all the people in Illinois receive all the needed dental services for health, esthetics and comfort.

Our first approach, to aid in reaching this goal, has been to work with the organized dental profession to obtain their guidance and support during the development stages of the program.

At the first meeting in January the Council on Dental Health approved an outline which gave us a concrete pattern to follow. From this outline several types of programs have been devised.

The first of these proposed programs was for the full-time county or city health department. These local health departments have taxed themselves to support a public health program. However, dentistry is not a required activity. For this reason we have offered an additional allotment or subsidy to these counties for the first two years, to induce them to include dentistry as a public health function. Under this plan we propose to loan the county or city equipment of the type and quality needed to carry on an effective remedial, preventive and educational program. Our Division has suggested that the county employ a dentist to work full time. He should have public health training or he may be an outstanding young dental graduate, who will be offered training after one year of successful service. The suggested salary for a young dentist is $4,800 per year and a travel allowance, or $6,000 plus travel for a dentist with public health training. Under this plan the state will pay the dentist's salary the first year in addition to furnishing dental equipment. It also will supply forms, records, and educational material to the county at no cost.

The local Health Department is expected to furnish travel, dental assistant, utilities, and all other needs for the operation of the program the first year. The second year all expenses for the operation of the total program are to be divided equally between the state and local health department. The third year the local health department is expected to adhere to a formula set up by our division of local health administration

which is at present 20 cents from the state and 80 cents from the local community.

Services Recommended

Counties accepting these programs are asked to provide three basic services in the total program. (1) Education for all people, which should include dental examinations and bite-wing x-rays for children. School examinations are required by law for all children entering school and not less than each four years thereafter. (2) Preventive service should be made available to those children whose parents are willing for them to receive the treatment and (3) remedial dental care should be provided for those children unable to obtain it otherwise.

The Searcy-Clabaugh Law which permits local counties to establish a health department states that at least one member on the Board of Health shall be a dentist. The Board dentist and the dentists in the county are asked to approve any local dental program to be undertaken, before it is put into effect. They are also asked to establish a criteria for those to receive remedial service. The local health department officials are requested to see that this criteria is administered efficiently and properly.

Four counties have accepted the plan for a fulltime dentist to be employed. They are Lee, Fulton, Peoria, and McLean Counties. Only one is in operation, due to lack of qualified personnel. Qualified personnel is one of our major problems in our program promotion. One other county, Adams, will be added to this group soon. Several other counties are in the formative stage. They have expressed an interest in the program but are not well enough organized to definitely sign a coordinating certificate.

Two other types of programs are proposed for local health departments that cannot afford a full time dentist. These programs function similar to the one mentioned above except they employ part-time dentists to work in a clinic or in their private offices. The private office plan is discouraged because only remedial service can be expected. It is also difficult to use groups of dentists on a part-time basis and expect to keep the program uniform. Three full-time health departments cooperating with our Division are operating programs with part-time dentists. They are East Side Health District, Will and Morgan Counties.

To prevent any discrimination and to offer service to all sections of the state a plan has been designed and offered to local communities without the services of a full-time health department. Under this plan the state offers financial assistance to a county that will agree to use our records and report their activities to our Division. They are expected to provide both educational and remedial service and preventive measures whenever practicable. The work is performed either in a clinic or the private dental office and the fee allowed is $5 per hour in the clinic and $6 per hour in the private office—all fees are disbursed on a reimbursement basis.

In any of these programs a local authority and the local health officer are expected to submit to our division a coordination certificate stating the amount of local funds available for this program. (All plans are subject to the statement "so long as funds are available.")

The Dental Division of the State Department of Public Health is carrying on an industrial program principally in the Chicago area. This program is primarily an educational program in which we make a survey of the oral condition of the employees. This service usually includes full-mouth x-rays. Employees are encouraged to secure adequate dental care from the local dentists. Following the survey recommendations are made to the plant management. These recommendations should encourage the plant to establish their own dental program. A great deal of research and study is indicated in the industrial dental field to determine the extent of industrial dental hazards and to learn more about oral conditions of the adult population.

The state is also developing a program using a dental x-ray technician for making bite-wing films on children in the schools. This program may become a substitution for school inspections. One technician can make approximately 100 pairs of films in one school day according to our recent surveys.

The Health Department is participating in the Evanston study where NaF is being added to the drinking water. We expect to assist in a study which may determine scientifically the value of tooth brushing and dentrifices as caries control measures. State Health Department laboratories are making lactobacillus counts available to the dentists at no cost. They supply dentists with a 2 per cent solution of sodium fluoride upon request. Cancer diagnosis is also available through our cancer diagnostic clinic. These services are becoming more popular every day as the local dentists become aware of them. Some assistance has been offered to the dental profession for in-service training, such as we are having here today.

For the Division of Public Health Dentistry of the State Department of Public Health to carry out the programs as outlined above, we have three dentists, one chief, one assistant chief and one field consultant. We also have one x-ray technician and three clerks. We expect to add to our staff this year one dentist and two x-ray technicians. If the entire state should develop full-time health departments with a full-time dentist on each staff, the state staff should never exceed six full-time dentists—two for administrative work and four for consultants to the counties. For pilot studies or research in public health dentistry we might need additional professional personnel on a temporary basis.

EXISTING DENTAL HEALTH PROGRAMS IN CHICAGO AND COOK COUNTY†

William P. Kroschel, D.D.S.*

The preceding discussion dealt with the dental health program in the State of Illinois. Dr. Kroschel's portion of the discussion concerned itself chiefly with the existing dental health programs in Chicago and Cook County.

He said, in planning a Public Health Dental Program for Cook County, it must be kept in mind that better than one-half of the population or 4,063,342 people in Illinois live in a 954 square mile area. The population represented here better than equals the combined peoples of Minnesota, South Dakota and Montana. It might be of interest that each of the above states with much smaller population than Cook County supports a full-time dental staff on the state level. Cook County, with its large population, is capable of supporting a full-time dental staff and should do so at an early date for the purpose of carrying on a well-rounded dental health program. Cook County has not supported a dental division in the Cook County Board of Health since 1944.

The Chicago Board of Health, however maintains the largest remedial dental service program in the county. Its facilities include 64 dental clinics which provide service for pre-school, school age and adult groups. At the present time only 52 of the clinics are in operation, 12 clinics having been closed during the

†Report of a talk given by Dr. Kroschel.
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war years because of the shortage of dentists.

Type of Dental Program

Dr. Kroschel went on to say that the dental services of the clinics administered by the Department of Health are restricted to extractions, fillings and prophylaxis. There is no over-all dental health educational program or a diagnostic and remedial service program for any age group in the community, and the dental care provided is available only under certain condition. In most of the clinics eligibility for care is limited to school-age children whose parents are financially unable to pay for the services of a private dentist. Clinics are maintained in public elementary schools, neighborhood clubs, a settlement house, a low cost housing project, and in connection with a venereal disease treatment center.

There are 47 active dental clinics and 12 inactive ones located in public school buildings. These are conducted in cooperation with the Chicago Board of Education, which provides the space and a large portion of the equipment. Services are restricted to grade school children living within the district. Clinic hours correspond to the regular school hours—9:00 A.M. to 3:30 P.M. The number of weekly sessions in the different clinics is determined by the actual demand for dental care within their respective areas.

Two additional dental clinics for school children are maintained in neighborhood boys' clubs—American Boys' Commonwealth, and Deborah Boys' Club. Dental services are available to pupils attending the public and parochial schools in the vicinity, as well as to members of these clubs. All of the clinic equipment is furnished by the sponsors of the clubs.

A program designed especially for preschool children is carried on in two clinics. One of these is established in a settlement house—the Mary Crane Clinic at Hull House. The other is maintained in the Ida B. Wells Housing Project. Both of these clinics extend their services to all pre-school children living in the area. At the present time, the Mary Crane Clinic also admits school-age children and maternity cases from the immediate neighborhood.

School children are certified as eligible for the service by the principals of the schools where they attend. All preschool children in the districts served by the two clinics organized for this age group are admitted without regard to family income. It should be noted that both of these preschool dental clinics are located in densely populated sections of the city where income levels are low.

In addition to the clinics for children, the Department of Health administers a remedial dental service program in connection with one of their venereal disease clinics. Patients who are attending any of the special treatment centers may be referred to this dental clinic for care. It operates one day each week throughout the calendar year.

On the average, each dentist sees 12 patients during a clinic period. Approximately four clinic visits are necessary to complete the needed dental services for the average person, including the preschool children. On the basis of data submitted by the clinicians, it is estimated that under the present program about 16,800 persons per year receive free dental care through the facilities of the Department of Health.

Dental Staff

Dr. Kroschel quoted some interesting facts about the Chicago Health Department. The dental service staff of the Chicago Department of Health consists of 30 dentists who are employed on a full-time basis. These include a director, a supervisor, and 28 clinicians. The director determines the policies of the department and is responsible to the Health Commissioner. The supervisor through regular inspection of clinic practices sees

to it that the policies are correctly interpreted and properly carried out by the clinicians.

He said, "I might add that the Dental Director has resigned. I believe the last two have resigned, and there is now an Acting Dental Director at the Chicago Board of Health Dental Clinic."

School Dental Health Program of the Chicago Dental Society

It was interesting to hear from Dr. Kroschel that the Committee on Dental Health Education, Chicago Dental Society has scheduled programs for fifty-nine new schools with an enrollment of nearly 13,000 children. From September 2, 1947, to January 23, 1948, these pupils will be provided with various types of educational materials, will be shown sound pictures on dental health, and will receive full mouth surveys. Those found to be dentally defective will receive referral slips which are to be taken to their family dentist. After corrections have been made, the dentist will sign the slip and it will become a permanent part of the pupils record when he returns it to school.

Most of the school dental health programs are located in Lake, Du Page and Cook Counties (outside of Chicago).

A small amount of dental health education is being accomplished in the Chicago elementary schools by the Chicago Board of Health in cooperation with the Chicago Dental Society. But this phase of the dental program is in the developmental stage and the Committee on Dental Health Education, Chicago Dental Society, is working together with the Chicago Board of Health on setting up a dental health educational program for the elementary school children of Chicago. The high schools in the city are waiting the outcome of a dental health educational program instituted as a pilot project in twelve of the schools. The dental health material is integrated with and is a part of the general health classes. If this program proves successful, it will be extended to all high schools in the city of Chicago. This is a cooperative project between the Board of Education and the Chicago Dental Society.

Cook County Health Department

The speaker went on further to say that at the time of the Chicago-Cook County Dental survey, physical facilities were available for a public health dental program in Des Plaines, Oak Forest, Robbins, Steger, and Wheeling, but because of the shortage of personnel none of these has been in operation since 1944. There is at present no dental officer on the staff of the County Health Department. As formerly administered, the dental program was under a director who was a dentist trained in the field of public health. At the time the clinics were closed, a well-rounded program was under way in three of the communities and plans were nearing completion to begin services in the other two.

During the years the dental program was functioning, the department operated three clinics on a five-day per week schedule (ten half-day periods) throughout the school year. In addition to oral examinations, remedial dental care was provided for preschool, grade school, and high school children, and for certain adult groups—expectant mothers and venereal disease patients. Offices of private practitioners were utilized to supplement the department's clinic facilities in areas where such need was indicated.

Remedial dental services were administered under policies established by the Dental Division of the Illinois Department of Public Health. Dentists were paid on an hourly basis from funds allocated by the State Health Department.

Evanston

Dr. Kroschel said of suburban Evanston that the Evanston Health Department serves as a coordinating agency for

the proper functioning of the school dental health program. All dental services received by the children are reported by their private dentists to the school authorities. A standardized dental record card for these reports was developed in cooperation with a committee of local dentists. This card is sent to the parent with the request that the child be taken to a dentist for examination and whatever dental service he may require. The dentist makes his report on the card of the child's dental need and the care given and mails it directly to the school. The card then becomes a permanent part of the child's school progress record.

In addition to this regular program, a special long-term research investigation is in progress on the relationship of fluorine in the drinking water and tooth decay. This project is being conducted by the Evanston Health Department with the cooperation of the Division of Public Health Dentistry of the Illinois Department of Public Health and of the Zoller Memorial Dental Clinic of the University of Chicago Clinics.

Oak Park

The speaker presented facts about Oak Park and Stickney. In Oak Park, the Health Department and the local dental society share jointly the responsibilities for the school dental program. All policies and the procedures to be followed are formulated by the dental society. The actual operation of the program is the responsibility of the Health Department. Dental services are limited to oral examinations of school children.

At the beginning of the school year parents are urged to have their children examined by their family dentists. A card is sent to each home from the school for a statement regarding the dental care completed for each school child or, in case no dental services have been obtained, for consent to a dental examination at school. The examination program is carried by the local dentists who serve without remuneration.

Stickney Township

The township of Stickney owns three complete dental offices and anticipates constructing two new buildings in which space will be provided for dental equipment. In April 1946 a plan which calls for a health center was voted by the township. This center is to employ two dentists.

For a number of years, the Health Department of Stickney Township provided remedial dental services for children whose parents were financially unable to afford this care and also for indigent adults. The future program is not as yet formulated, but at the present time no type of public dental service is available in the community.

Winnetka-Kenilworth

Dr. Kroschel reported as follows on Winnetka-Kenilworth: The policies of the dental health program in these adjoining villages are determined by the health officers in cooperation with the local dentists and the boards of education. The program has been in operation for sixteen years.

Annual dental examinations of all pupils from kindergarten through high school are required. At the beginning of the school year, each pupil who has been examined by his family dentist presents a certificate signed by him stating that all necessary dental care has been completed. Pupils who do not have certificates are examined at school and referred to their own dentists for the needed dental services.

At the request of the health officers, the local dental society assigns dentists to the different schools to examine the children who fail to bring certificates. These dentists are paid an hourly fee for their services. The Boards of Education allocate funds to the Health Department to cover this expense.

Children whose families are unable to pay for remedial care have the needed

services provided for them through the Family Welfare Society.

School nurses follow up all cases requiring dental services, urging that remedial care be obtained or, where necessary, assisting the family through the proper channels to secure care.

Dental Services by Boards of Education

Dr. Kroschel's talk included reports of Boards of Education. There are four communities in Cook County in which the dental program is under the control of boards of education. In three of these the operating expense is included as part of the regular school budget, and in the other is met by a special public health committee.

Arlington Heights

The dental service program of the Arlington Heights school has been in operation since 1930. Policies are jointly determined by the Board of Education, and the local Health Department, and a lay organization known as the Public Health Committee. Funds are provided by the lay group.

Services include examinations, prophylaxis, extractions and fillings and are available to all grade school pupils. The aim of the program is to determine the dental needs of school children and to have the required corrections made. Parents may make applications to the school for dental care, or children may be referred in connection with the follow-up of the school dental examinations.

The dental staff consists of five part-time dentists who are paid on an hourly basis. Remedial services are given in the private offices of the dentists. Children whose parents are able to pay part of the fee are charged at a reduced rate; those who cannot afford to pay for the service receive free care. Eligibility for the reduced fee and for free service is determined by the school nurse.

Bellwood

Dental care for school children is provided by the Board of Education of School District 88 at Bellwood. The school employs a nurse and a part-time dentist who is on a yearly salary. Operating expenses of the program are met by fees and school funds. The dentist spends one-half day each week during the school year in the school clinic. Prophylaxis, extractions, and fillings are provided for a fee to those who can afford to pay for service and without charge to all other children.

Cicero

The school dental program of Cicero is restricted to diagnostic service. A part-time dentist is employed by the local Board of Education on a salary basis. All school children receive oral examinations and indigent children are referred to the Cicero Welfare Center for remedial care. Efforts are made by the nurse and teachers to have the parents take the children who need dental care to their private dentists.

La Grange

School District 102 of Cook County, located at La Grange, maintains a dental clinic as a part of its regular school health program. Children who are not examined by their family dentist are seen by the school dentist. After the examinations are completed, arrangements are made for the children whose families cannot afford to pay private fees to receive the required dental care free.

Clinics are operated one-half day each week during the school year. A part-time dentist who is on salary and a nurse are in charge of the program. The services provided include examinations, prophylaxis, extractions, and fillings. Eligibility for free care is determined by the nurse.

Dental Services by Unattached Clinics

The Senior Dental Surgeon's report went on to say that in four communities dental programs are conducted by voluntary organizations either as a supple-

ment to the school health program or as an independent service. Five part-time dentists are employed to provide free dental care for children of low income groups.

Cicero Welfare Center

A dental clinic is maintained by the Cicero Welfare Center as a supplement to the regular dental program of the public schools. The policies of the clinic are determined by the local department of health, but the administration of the clinic is under the Welfare Center. Funds are allocated from the Community Chest to the amount of $50 a month and the balance of the operating expense is borne by the city government.

Dental care is provided for indigent grade school and high school pupils. Referrals to the Welfare Center are made by the school nurse and by teachers but eligibility for care is decided by the Executive Secretary of the Welfare Center.

A part-time dentist gives two half-days each week to the program. He is paid a yearly salary. A nurse assists him during the clinic session. The usual types of services to school children are provided. These are restricted to prophylaxis, extractions and fillings. About six children are treated during a clinic period.

Evanston Junior League

The Evanston Junior League operates a dental clinic for preschool and school children from the low income groups. Services are provided for a small fee which is paid at each visit.

The clinic staff includes two part-time dentists who are employed on a yearly salary basis, two dental assistants, and two clerks. Clinic sessions are held once a week. Prophylaxis, extractions, and fillings and x-rays are available to all children of lower income families.

Melrose Park

St. Paul's Lutheran Church conducts a dental program for the school children enrolled in the St. Paul's Lutheran School. The purpose of the program is to promote dental health education and to see that all children graduated from this parochial school have the needed dental corrections made prior to graduation. The agency reports that every graduate during the past seventeen years has been free from dental defects at the time he left the school.

Kindergarten and school children are given free dental examinations. Follow-up is carried out through the joint efforts of the church group and the school authorities. The dental examinations are made by a local dentist on a voluntary basis. He is provided a nurse assistant.

Wilmette Health Center

Free dental care is extended to preschool, school and high school children whose families are financially unable to afford the services of a private practitioner. Dental funds are contributed by the official welfare agency of the village. The clinic operates on a schedule of four half-days each week. One part-time dentist and a nurse are employed on a salary basis by the Health Center. Four types of services are offered. These are prophylaxis, extractions, fillings and x-rays.

Dr. Kroschel concluded by mentioning that supplementing the various programs that he had discussed are hospital dental clinics for children. Also independent clinics, such as the Salvation Army which maintains several clinics; these do a considerable amount of work on children.

PROPOSED DENTAL HEALTH SOLUTIONS AND A. D. A. PROGRAM

Allen O. Gruebbel, D.D.S., M.P.H.*

The growth of dentistry as a personal health service is well known to you. There is no longer any question about the value of modern dental services as provided by practicing dentists. Similarly, there is also no longer any question about the need for some kind of group action through community effort. In other words, we know that groups of individuals, whether they be school authorities, school children, parents, or civic groups, should do something to improve dental health, but there still is some difference of opinion as to what they should do and how they should do it.

The keystone of the provision of dental service in our American society rests in the private dental office. I am convinced that it will remain there so long as our American democracy survives, and I hope that will be a long time. But in preserving private practice we must never forget that it is also a part of our American democracy to maintain and to strive to improve certain community services. For example, groups of individuals, known as communities, have provided themselves with city water supplies, fire protection, police departments, street and parking maintenances. All of these community services were developed because it was more expedient and more economical to provide them through group action than for each individual or family to provide his own city water or his own water supply, his own fire protection, his own police department, and his own street and sidewalk maintenance.

The same reasoning applies with equal logic to certain types of health services. However, we need to determine the types of health services that are the responsibility of the individual and those that are the responsibility of the community. Those of you who are in the third group and will meet tomorrow in group 3 will wrestle with this question, and I think it is a very important one.

Eras of Public Health Movement

Now let's consider just a moment from the philosophical and historical standpoint—and I will do it very briefly—just how these health services developed within our communities. When this country was first founded, community health services were quite primitive. During the colonial days, for example, the only types of community services that our forefathers had were some simple types of sanitation services, primarily the draining of surface water, primitive types of waste disposal, and regulation of slaughterhouses, and such nuisances as that. This era in our early community health service was called the Sanitation Era, and it really extended over quite a few years before any material improvement was made in the community health service.

However, when immunization was discovered as a means for controlling communicable diseases, immunization against these diseases became a community health project. Thus prevention, the prevention of disease through immunization, represented the second of the eras in the promotion of community health. It was not long after that, that

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specific services to the individual in the form of medical services were included in some limited ways, as, for example, in the eleemosynary institutions and for underprivileged children.

Thus then we have the entire field which is now present in our current public health practice covered in the three eras of the public health movement: First, sanitation; second, prevention; and, third, medical treatment even though it is now limited.

The administration of the community health services just didn't happen by accident. I mean they didn't happen to develop to the extent which they are developed today by accident. Specialists and scientists were needed in this growing community service. To do this job scientifically and to do it effectively they needed medical officers, trained medical officers. Soon they found they needed epidemiologists to study the occurrence of communicable diseases. They needed bacteriologists to operate their laboratories. They needed pediatricians who were specialists in the disease of children. They needed public health nurses to perform the service which we now know they perform. They needed sanitary engineers to study scientifically the supply of public waters and the disposal of sewage. They needed statisticians to accumulate necessary data in order to determine scientifically how these services could be rendered most economically and most effectively. They needed chemists to perform the chemical tests in the state laboratories or community laboratories, and, above all, they needed a health educator.

Dentistry and Public Health

It is easy to see that from the early times which I described a minute ago until now the broad field of community health service has actually become a science in which these trained specialists have a very important part to play. Where does dentistry fit into this picture? Prior to 1918 dentistry was not included in this growing health service, because dental diseases and defects were not recognized as a health problem, and particularly because the communicable diseases at that time were of such proportion that they required the total objective. The dental health needs of children were not given serious attention until the turn of the century. Neither the dental profession or the public associated these dental health needs with the status of national health until the results of the examinations of draftees were made public following World War I. Since that time hundreds of surveys have been conducted involving hundreds of thousands of children.

Attempts to Improve Dental Health

These surveys have revealed the size of the problem, which is well known to you and which will not have to be repeated here. What did the public and the dental profession do about it in the early stages? I mean about the dental health problem of children. The first attempts to improve dental health through group action were commendable, but, on the other hand, were representative of the dental health concepts that prevailed at the time. "A clean tooth will not decay" was the slogan of the day, and you will recall that that was the slogan until a few years ago. Oral hygiene demonstrations, tooth brush drills in school, became the mechanism by which community health was to be improved. That, together with health education and this slogan, "A clean tooth wil not decay," I believe was coined by Dr. Leon Williams, who studied and recognized the important work of the investigators of caries, particularly those which preceded the present investigators.

I am talking now about when the emphasis was placed on tooth brush drills in school and oral hygiene. This era might well be named the Sanitation Era, and in a sense represented the first stage in the development of dental programs,

just as the sanitation era in the general field of public health was the first step in a community health service.

What benefits have been derived from this first attempt at dental disease control are unknown. At any rate, acceptable statistical data have not been published in enough literature to permit an evaluation of oral hygiene.

Dental Care Program

Then, of course, you know, what happened from that point on. Dentists recognized that more than that was needed. So the next step was the periodic dental examination or dental inspection of children in the school program. Then after that was done it was recognized that something had to be done about the defects which were found, and so naturally a care program was instituted. Children who could go to their own private dentists were referred to their own private dentists, and those who were underprivileged were provided for in a small measure in some community clinic services, and now we are coming into the final era of this public health scientific movement, that is prevention, which actually is the fundamental approach to solving any public health problem.

Dr. Kesel has described the things which are now being used, at least experimentally, as a means for partially controlling dental caries. I think we are on the verge right now of applying this fundamental principle in medicine and dentistry. That is, prevention is one means for doing something about our very large problem.

Now, out of this background of experience has come the realization that the prevention and control of dental diseases involves more than individual effort on the part of the individual or by his own private dentist. Other actions are also needed to supplement those of the individual and his dentist, which can be carried out more expediently and more economically through group action or through community service, just as I described a minute ago these other specialized services were developed.

National Health Program Committee

Apparently the American Dental Association came to this same conclusion in about 1937 or 1938 when its House of Delegates established the National Health Program Committee, of which I believe Dr. Harold Oppice was the Chairman at that time. The report of this committee is a landmark in dental health planning in my opinion. The committee established a basic philosophy which was recognized as being sound and realistic. The recommendations, designed to stimulate group and community action, resulted in the establishment of many of the state and community programs in effect today.

The committee recommended the establishment of research projects. It recommended specific methods for conducting health education activity, and it recommended dental care services for children, to be provided in private dental offices, dental clinics, and mobile dental units, depending on the local circumstances. The committee's actions, all of which were approved by the House of Delegates, have served as a foundation upon which other committees of the American Dental Association or state and local dental societies, could build. They have been elaborated upon and modified in recent years to meet changing conditions and to take advantage of new knowledge, but the original concept remains unchanged.

Before outlining the program of the American Dental Association, it might be well to have a brief look at several of the other proposals which have been given wide publicity. Plans have been proposed for improving dental health, and these plans can be divided into two very large categories.

First, the extension of school and community health services as we know them today, which consist mainly of pre-

ventive sciences or of those procedures which we have in the dental profession found to be effective in preventing dental diseases—dental health education, both of children and the adult population at large, and dental care for children who cannot obtain dental care in private offices. This type of dental health plan has been approved by the dental profession, officially by its official society. However, we still are not too certain how these services should be provided. We have established a basic principle, the basic concept of what these services should be in a community health service, but we are not too sure how these services should be provided. I hope that we will have some of the answers Sunday when the committees bring in their reports.

The second large category of proposals which have been made are those plans which are designed to aid individuals and families to finance or to pay for dental care, and under such plans as compulsory health insurance, voluntary prepayment plans, and postpayment plans. The one that we hear the most about, of course, and the one that the speaker who preceded me mentioned, is compulsory health insurance. So much has been said and written about this plan that a detailed description of the plan by me is unnecessary, particularly since the provisions of the Wagner-Murray-Dingell Bill were outlined by Dr. Easlick this morning. It is sufficient, I think, for the purpose of this discussion, to say that compulsory health insurance is not acceptable to the dental and medical professions and that in all probability it is not acceptable to the public.

Voluntary Prepayment Plans

Voluntary prepayment plans, however, are an entirely different matter. Voluntary prepayment plans are acceptable to the dental profession as a general principle. At any rate, the voluntary prepayment principle was approved by our House of Delegates some years ago. Actually, if the representative of the American Medical Association who spoke a moment ago had had the time to elaborate more fully I believe he would have told you that the organization of the voluntary prepayment plan is the main principle of the A.M.A. health program. They are actively supporting the organization and development of voluntary prepayment medical and hospital care plans. The growth of prepayment hospital and medical care plans has been really phenomenal. Approximately 20 million persons in this country are enrolled in Blue Cross plans, and about 2 million persons are covered in prepayment medical care plans, which are under the sponsorship of and which were organized by medical societies.

Unfortunately, we do not have any experience in the dental field with respect to the prepayment principle. The problem of providing dental care under prepayment plans as compared with medicine or medical or hospital care is quite different because everyone needs periodic dental care. It isn't everyone who needs periodic hospital care or even periodic medical care of specific types. It is possible to budget for dental care expense, but we do not know if the insurance principle can be applied to financing dental service under a prepayment principle.

After studying this problem for more than two years the Council on Dental Health of the American Dental Association concluded that there is not sufficient factual or statistical information available to determine the feasibility of applying the prepayment principle to the provision of dental services. The Council, incidentally, does hope, however, that some dental society somewhere will try one, a voluntary prepayment plan on a small scale basis to see if it will work or not.

We might now conclude this discussion by refreshing our memories as to the program of the American Dental Association and the philosophies behind the principles and goals that you have adopted, and I mean that just as I said it,

because certainly you were represented by the official representatives in our House of Delegates and they spoke for you in adopting the principles which we follow and the principles which we believe to be the ones that should be followed.

First I should like to give you some reasoning behind these principles and goals, because they are very fundamental not only to the adoption of plans but also to your discussion tomorrow in my opinion.

Unlike most of the other public health problems, dental diseases are distributed among almost the entire population. Dental defects begin in young children. In general terms these defects occur six times faster than they are being corrected, resulting in a pyramiding of unmet needs as children become youths and as youths become adults. The level of health in this country would be vastly improved if every person received complete dental care. However, assuming that all persons would want such care, it would not be possible to provide complete service for more than 40 per cent of the population owing to the inadequate number and poor distribution of dentists.

Preventive Procedures

The most logical method for reducing the size of the dental disease problem is through prevention. Recent studies indicate that preventive procedures have been discovered to reduce the incidence of at least one of these dental diseases and that is dental caries. Dr. Easlick told you about that. In the absence of a completely effective prevention method, dental diseases can be controlled most effectively through early detection and treatment of dental defects, beginning with children. The demand for service is almost entirely dependent upon the emphasis which individuals place upon dental health and by certain psychological blocks resulting in fear, misunderstanding, and indifference.

The program of the American Dental Association was designed to solve those problems in an orderly and realistic manner by employing practical and efficient methods that are in keeping with the highest professional standards.

A.D.A. Recommendations

The American Dental Associtaion recommends first, then, that adequate provisions be made for research. Only a relatively few properly trained workers are presently engaged in scientific investigation. The American Dental Association recommends further that facilities be expanded to carry out more extensive health education activity. It is an accepted fact that health education is an essential part of any health program. It has also been demonstrated that people will seek dental care when they have developed an appreciation for it. Contrary to general belief, the dissemination of information is not the primary aim of health education. Instead its chief purpose is to motivate people to practice good health habits. Knowing is not necessarily followed by doing something. In a health program it is more important to secure action through motivation than it is to impart knowledge through teaching of facts.

Reports in dental literature over the past twenty years reveal that children receive a comparatively small percentage of the total amount of dental care rendered. Although there has been a gradual increase in dentistry for children less than 20 per cent of the children under 15 years of age receive the dental care even today; therefore, in the opinion of the American Dental Association every community should organize and maintain an effective dental health program for children. That, together, with health education and prevention is the fundamental tenet upon which the American Dental Association's program is built.

In summarizing these principles on these basic objectives, they are, first, research; second, dental health education; third, dental care; and, fourth, participation by dentists in community plan-

(Continued on page 128)

Veterans' Administration—Dental Service

Report of the Public Welfare Committee

During the Chicago Dental Society meeting your committee made a visit to the Regional Office of Veterans Administration to determine the true facts concerning the out-patient dental program of Veterans Administration so we could report to the dental profession in Illinois.

We are able to report that free and complete access to both personnel and records was made available to us, so that we could question personnel and examine reports as we sat fit and to advance any and all questions that have been in the minds of the profession for some time.

First we would like to report that all the effort of the dental service is now being put to the huge task of payment. These completed cases are now being paid at the rate of approximately 1500 per week, and this figure should increase until all completed cases are paid. This action should be finished in the near future.

Also it was called to our attention that any case on which treatment has been completed and received in the office prior to October 1, 1947, should now have been paid. Any of the profession who have completed treatment cases submitted prior to that date, and on which payment has not been made, are requested to forward the name of the veteran and date of submission to the Regional Office in Chicago so that any irregularity may be rectified.

The question of examinations made twelve or more months ago and upon which neither the participating dentists nor the veteran have had no word was raised.

Your committee was shown that for various reasons the entitlement to treatment in many of these cases has not been proven and that some fifteen thousand old examinations are now in the process of being paid.

The administration is well aware of the professional aspects of these examinations due to their age. In the event a veteran is found entitled, a new and usable examination will be authorized.

In connection with authorization of examination and/or treatment; it has been rumored that delay in payment was due to the fact that funds were not available. Your committee would like to make it very plain that in all instances in which you receive authorization for examination or treatment funds for same have been encumbered by the using agency. Please bear in mind that this rumor is nothing but idle gossip coming from uninformed sources.

The only reason for delay of any kind has been brought about due to the immensity of a task far beyond either the profession's or the administration's expectations.

Reports shown your committee disclosed the fact that there is a pending case load in the office of some 53,000 cases. A break-down of this report showed that of this number approximately 36,000 are in the proper divisions awaiting service records on which to determine entitlement to or denial of treatment. As rapidly as these cases are processed and forwarded to the dental service immediate action is taken to inform the veteran of the findings, either by letter of denial of treatment or by the issuance of an authorization for an examination with the purpose of treatment in mind.

Also it was pointed out that practically without exception each of the previously mentioned 36,000 cases was filed after the expiration date of one year following discharge, or the application did not contain sufficient information upon which authorization of treatment could be predicated.

There are 5609 examinations in the hands of dentists who have as yet failed

(Continued on page 128)

Decade Diary

March 1938

"Shadows Before" was the title of the first of two thought stimulating editorials. This one called attention to the preparation for our annual May meeting. "We have our Study Clubs, component gatherings, Mid-Winter meeting, American Dental; all true, but can anyone advance one cogent reason why it would be better to have less?" Also true today.

"Dentists and the Invisible Driver" was the second editorial's heading and referred to a recently written article appearing in a Chicago newspaper anent increasing automobile deaths. The Editor not only published the newspaper article but made some excellent comments. This issue contained two excellent scientific papers: "Accidents in Oral Surgery and How to Prevent Them" by Dr. Leroy M. S. Miner, of Boston, Massachusetts, and "Dentistry's Responsibility" by Dr. Ralph L. Ireland, of Lincoln, Nebraska. Also published was a most interesting letter from one of our former state society presidents, Arthur G. Smith, of Peoria, who had moved to Tryon, North Carolina.

April 1938

This issue was devoted exclusively to the 74th annual meeting of our Society. From the Official Call of Secretary C. N. Newlin and Greetings from President E. C. Pendleton to the last named clinician—all were recorded and ready.—*Neil D. Vedder, D.D.S.*

COMING IN NOVEMBER

PHOTOGRAPHS
OF

OFFICERS

ESSAYISTS

CLINICIANS

COMMITTEE CHAIRMEN

MEMBERS IN GENERAL

NEW and OLD

➡ Watch For Our Big, New Rotogravure Section

SEE HOW MANY YOU CAN IDENTIFY

WE BEG YOUR PARDON

NO,

THE CLOCKS HAVE NOT BEGUN TO RUN BACKWARDS, NOR HAVE WE MISPLACED OUR CALENDAR. THIS IS THE MARCH ISSUE OF YOUR JOURNAL! FIRST THERE WAS A PRINTERS' STRIKE; THEN, THE STATE MEETING; AND FINALLY, THE DIRECTORY OF MEMBERSHIP. AT LONG LAST WE HAVE BEEN ABLE TO ALLOW SUFFICIENT TIME TO HAVE THIS ISSUE PRINTED. WE TRUST YOU WILL ENJOY, EVEN AT THIS LATE DATE, THE WORTH WHILE REPORTS FROM THE ILLINOIS DENTAL HEALTH CONFERENCE. THANK YOU FOR YOUR PATIENT COOPERATION.

WM. P. SCHOEN, JR.,
Editor.

CURRENT NEWS AND COMMENT

FLUORINE AND DENTAL CARIES

Since fluorine was discovered in drinking water[1] and identified as the causative agent for mottled enamel,[2] many reports have appeared showing the widespread distribution of areas of endemic fluorosis. The positive correlation between a concentration of fluorine in potable water of 1 part per million or more and mottled enamel of the teeth of children consuming this water since early infancy has been established. However, the fact that fluorine may have an other than deleterious effect on the teeth of children was first suggested in this country by Dean,[3] who commented on the rarity of dental caries in those areas where endemic fluorosis exists. Later,[4] on the basis of dental examinations of over 7,000 children in twenty-one cities, the conclusion was reached that there exists a general inverse relationship between the fluorine in the drinking water and the caries rate in children continuously consuming the water throughout life. Moreover, Klein[5] reported that this influence of fluorine can be demonstrated in children who have been exposed to drinking water containing this element for the first time, after reaching school age. There are indications[6] that the inhibiting effects of fluorine on dental caries can be demonstrated for a long time after removal of the element from the water supply. Furthermore, the suppression of the count of Lactobacillus acidophilus likewise endured. This organism was early implicated[7] in the causation of dental caries; later it was shown[8] that fluorine in such concentrations as occur in some potable waters suppresses acid production by the organism though not necessarily inhibiting its growth. A study of the available evidence led McClure[9] to state that from 0.5 to 1 part per million of fluorine in the drinking water is instrumental in reducing caries and that the evidence does not indicate that this constitutes a health hazard. The neighboring cities Newburgh and Kingston, N. Y., both originally used water low in fluorine. In 1944 the addition of 1 part per million of fluorine to the water supply was begun in Newburgh but not in Kingston. Recently, a report[10] compared the acidophilus count in the saliva of a large number of children 12 to 14 years of age in both cities with that before the experiment was begun. In Kingston the frequency of high and low counts remained in 1947 as it was in 1944; in Newburgh a progressive drop in the frequency of high counts and an increase in the proportion of low counts had occurred, thus indicating results in the direction of suppressing the acid-producing organisms in the mouth. Additional significant data are eagerly awaited from this study; further favorable results will mark progress in conquering a most vexing medical problem.

J.A.M.A., Vol. 136, No. 2, January 10, 1948.

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3. Dean, H. T.: Pub. Health Rep. 53:1443, 1938.
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7. Bunting, R. W.; Crowley, M.; Hard, D. G., and Keller, M.: Dent. Cosmos 70:1002, 1928.
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J. W. COLEMAN
1892-1947

Dr. James W. Coleman, 55, died at St. Joseph's Infirmary, Hot Springs, Arkansas, on December 13, 1947. He was stricken the Monday following his arrival in Hot Springs and his condition had been critical from the inception of his illness.

Dr. Coleman was born in Alton, the son of the late John and Kate Coleman. He was graduated from Washington University School of Dentistry, St. Louis, Missouri, and since his graduation had practiced his profession in Alton. During World War I he was a captain in the Dental Corps and saw service in France.

He was active in the city, county and state dental societies. As a member of the American Legion he headed for many years the committee on awards to outstanding graduates of public junior high and parochial grade schools. He was also a member of the Veterans of Foreign Wars, of the Elks and of the Kiwanis Club.

He is survived by his son, James, a student in the dental school of Washington University, St. Louis. Also surviving are a sister, Mrs. Ida Ziegler, and two brothers, Harry and John.

J. R. DOTY, DIRECTOR, A.D.A. BUREAU OF CHEMISTRY

The appointment of Dr. J. Roy Doty, Chicago, as director of the Bureau of Chemistry of the American Dental Association has been announced by the Association.

Dr. Doty has been on the staff of the Association since 1943 and in recent years has been senior chemist associated with the A.D.A. Council on Dental Therapeutics. In his new position, Dr. Doty will be in charge of research in the Association's laboratories in Chicago, where various chemicals and drugs used by the dental profession are examined.

Prior to joining the A.D.A. staff, Dr. Doty served as assistant professor of physiology at Louisiana State University School of Medicine. He also is a former instructor of analytical chemistry at Monmouth College. He received his Ph.D degree at the University of Illinois in 1933.

Dr. Doty has been a frequent contributor of articles on chemical research to scientific journals including such publications as Analytical Chemistry, the Journal of Biological Chemistry and the American Journal of Physiology. He is a member of the American Association of Biological Chemists and the American Chemical Society.

COURSES TO BE OFFERED AT UNIVERSITY OF ILLINOIS

Two separate postgraduate courses in "Recent Advances in Caries Control" and "Periodontia III: Histopathology of the Gingival and Periodontal Structures" will be offered on February 11-12 by the University of Illinois College of Dentistry.

The courses will be conducted on a Friday and Saturday, immediately following the mid-winter meeting of the Chicago Dental Society. Each was formerly offered as an evening course in a series of lectures but the sessions have been combined for the convenience of dentists who do not reside in the Chicago area.

Dr. Robert G. Kesel will direct the course in "Recent Advances in Caries Control." Dr. Balint Orban is in charge of the second course, "Periodontia III," which includes microscopic study.

Enrollment in the course is limited. Registration may be made by writing to Dr. Isaac Schour, University of Illinois College of Dentistry, 808 S. Wood St., Chicago 12, Ill. The courses will be offered under the provisions of the G. I. Bill of Rights, but are open to non-veterans as well.

PROPOSED DENTAL HEALTH SOLUTIONS AND A.D.A. PROGRAM

(Continued from page 121)

ning. By that I mean that in every community where a dental health plan is discussed there should be authorized representatives of the dental profession.

In the light of these adopted policies what then can the individual dentist do to aid in solving this serious health problem? He can put into practice the aims and ideals of the dental profession which have been enunciated in the official action of the dental societies, both national, state and local. He can assist in disseminating authentic dental health information. He can employ preventive procedures in practice and advise community leaders and health authorities as to whether or not scientific evidence warrants the use of preventive procedures on a mass treatment basis. I am referring particularly to the possible topical application of sodium chloride, the fluorination of public water supply, the possible use of synthetic vitamin K, and penicillin. The dental profession can assist in establishing professional standards and realistic policies for promoting dental health. By doing these things and by following the recommendations of your House of Delegates, the program of the American Dental Association can be put into effect to help every American appreciate the importance of a healthy mouth. By helping every American to appreciate the relationship of dental health to general health and appearance; by encouraging the observance of dental health practices, including dental care, professional care, proper diet and oral habits; by enlisting the aid of all groups and agencies interested in the promotion of health; by correlating dental health activities with general health programs, and by stimulating the development of resources for making dental health available to all children and youth; and last, but certainly not least, by stimulating dentists to perform adequate dental service for children.

To secure these actions will require the cooperation of all groups interested in the promotion of health. It is our professional responsibility to provide leadership. The current series of conferences of which this is one on dental health planning is dedicated to this purpose.

VETERANS ADMINISTRATION—DENTAL SERVICE

(Continued from page 122)

to complete and return them, 1260 cases where examinations have not been authorized, and some 4700 completed and current examinations where treatment has not as yet been approved.

An interesting observation was also made from the reports that showed a reduction in the case load from 76,000 October 1, 1947, to 53,000 February 1, 1948. This in spite of the fact that 15,910 new applications for out-patient treatment were received during that time. This would mean that approximately 36,000 cases were processed during the four month period.

In sum total the inspection of the office showed that an honest effort is being made to authorize treatment and pay for it with the personnel that is available for their use.

From time to time your committee will give to the profession information regarding the activity of the Veterans Administration out-patient dental program so that you will learn first-hand the progress being made.—*L. E. Steward, Chairman Public Welfare Committee.*

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Watch the JOURNAL!

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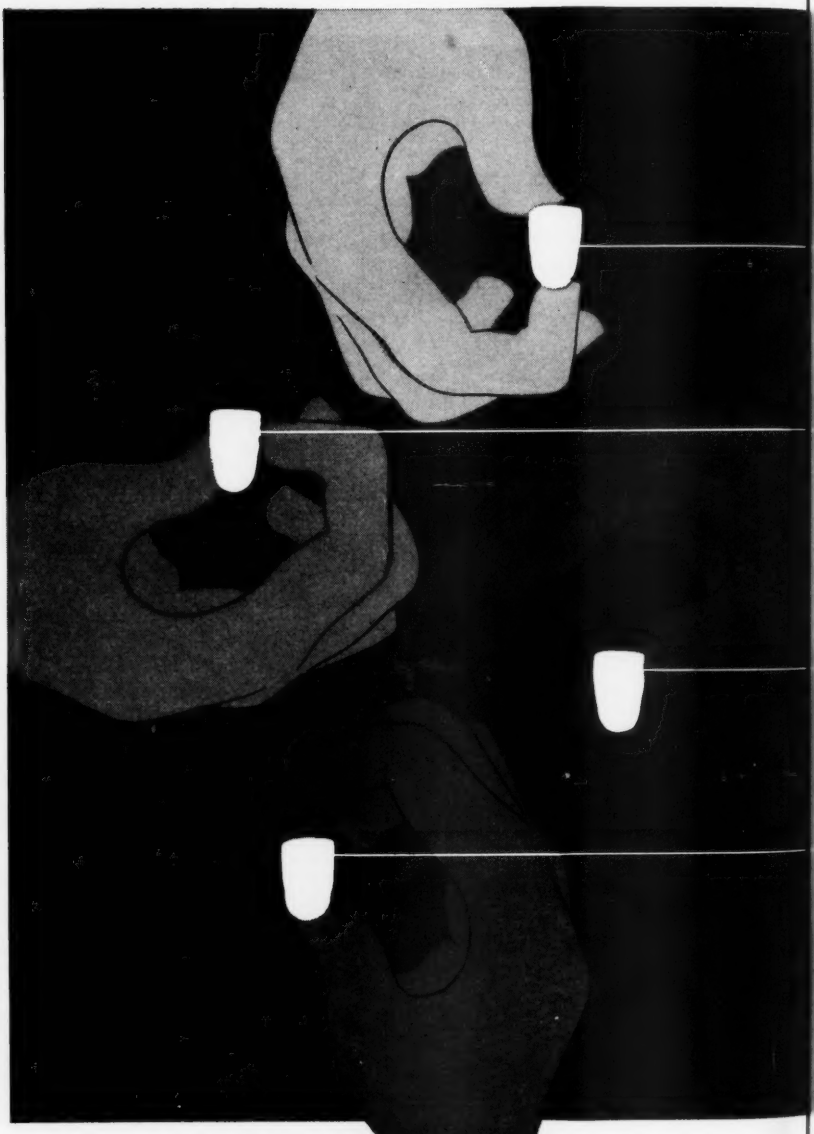

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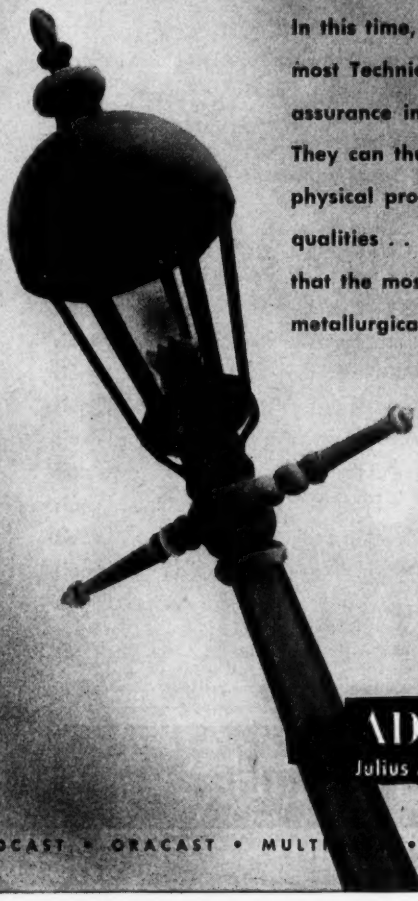

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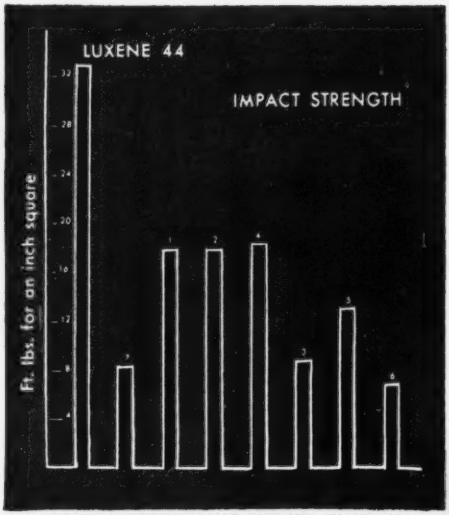

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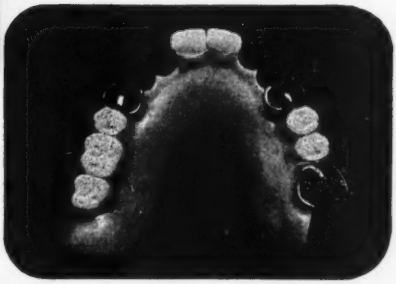

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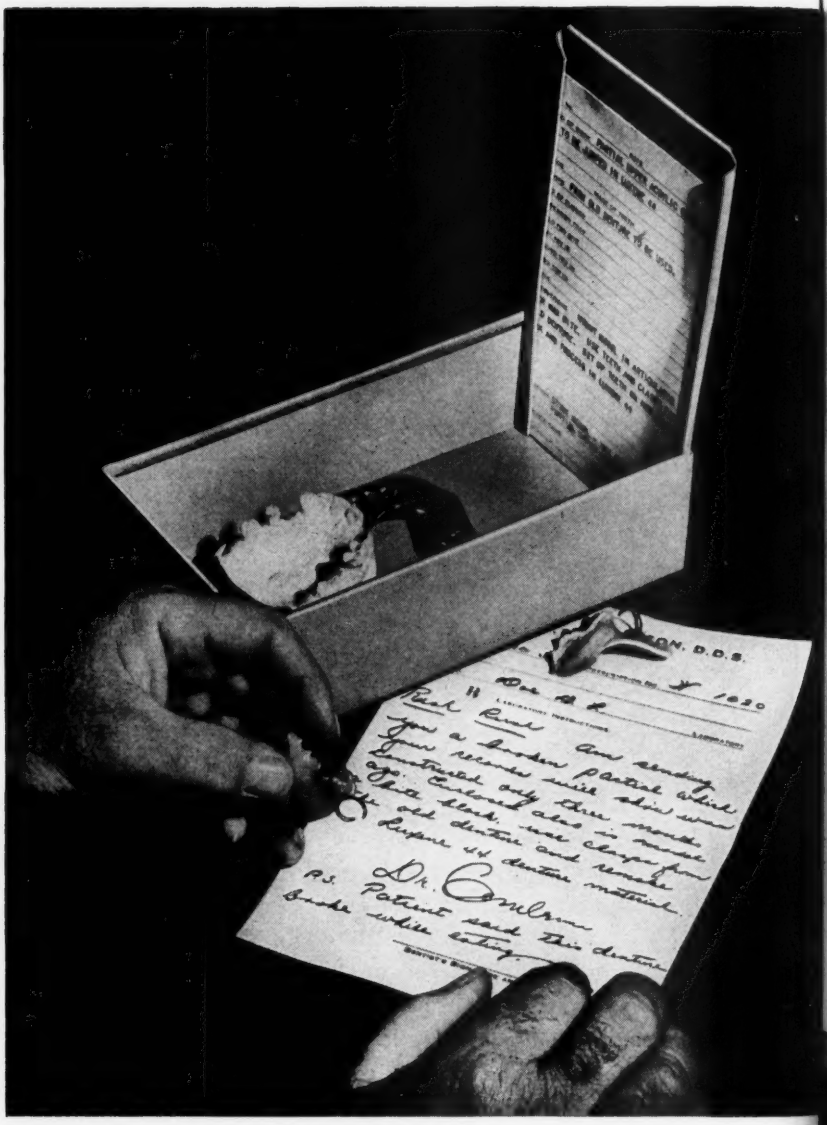

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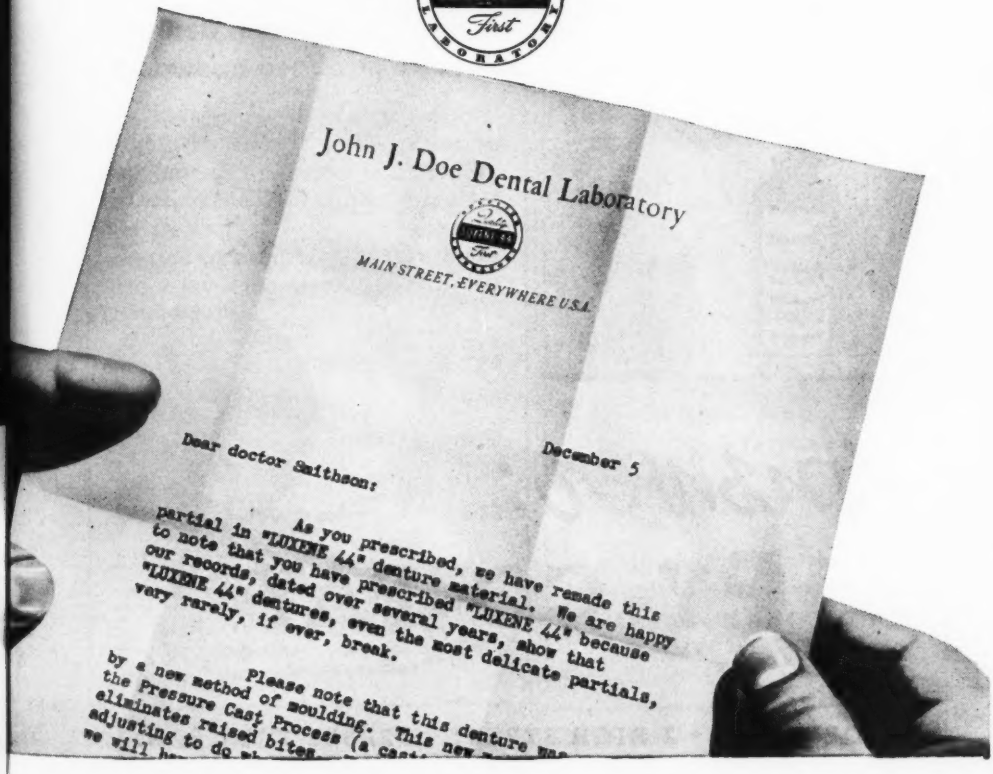
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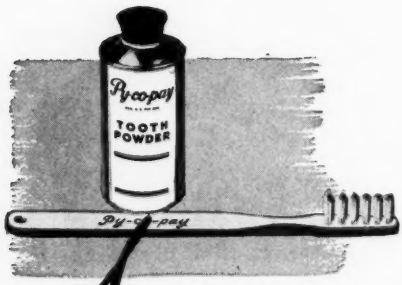

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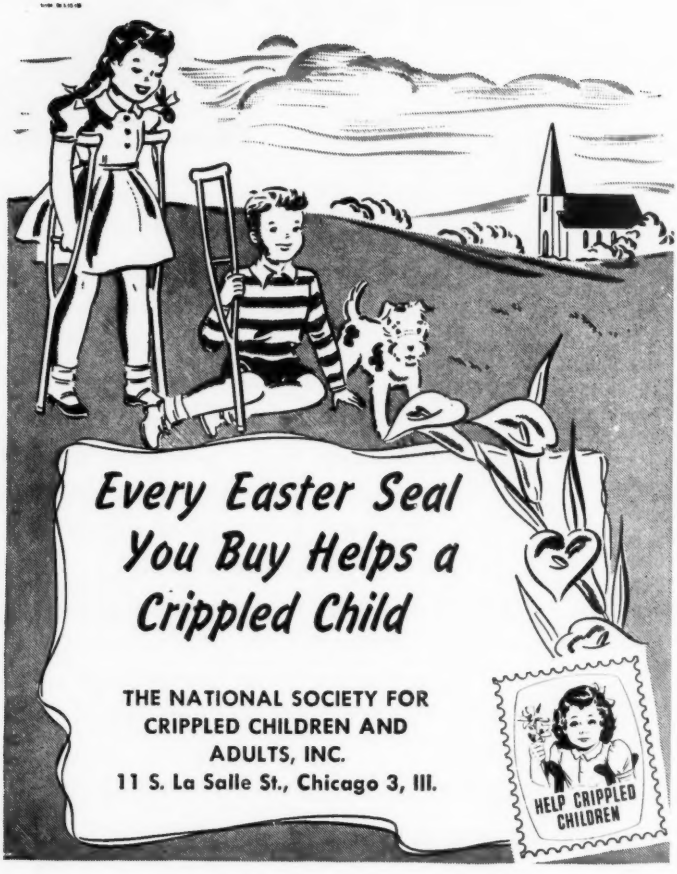
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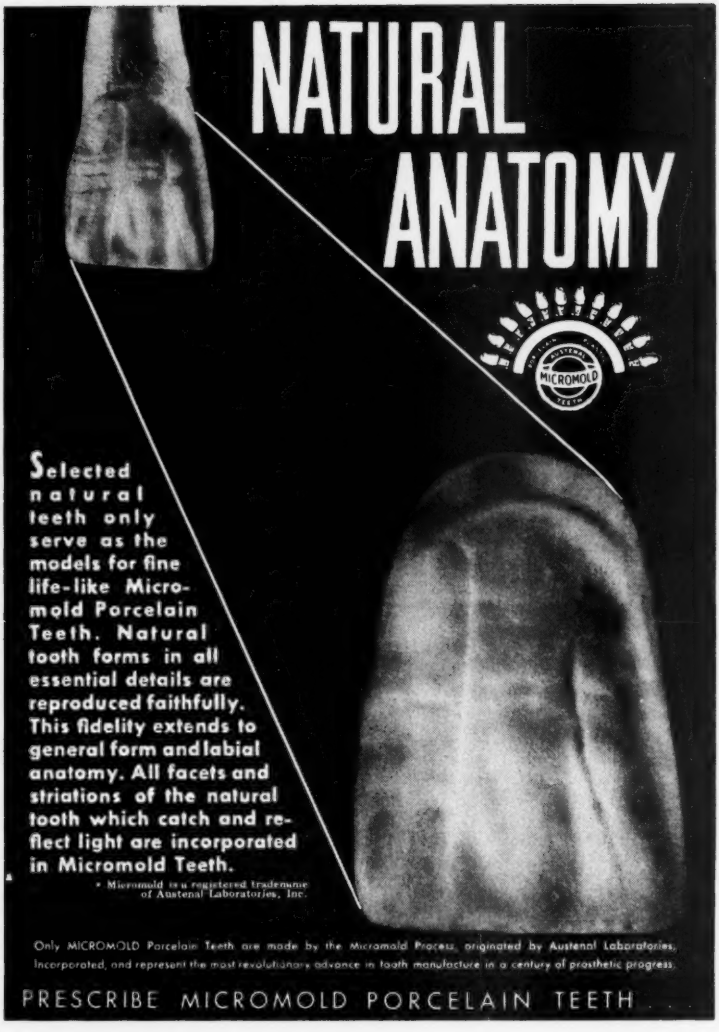
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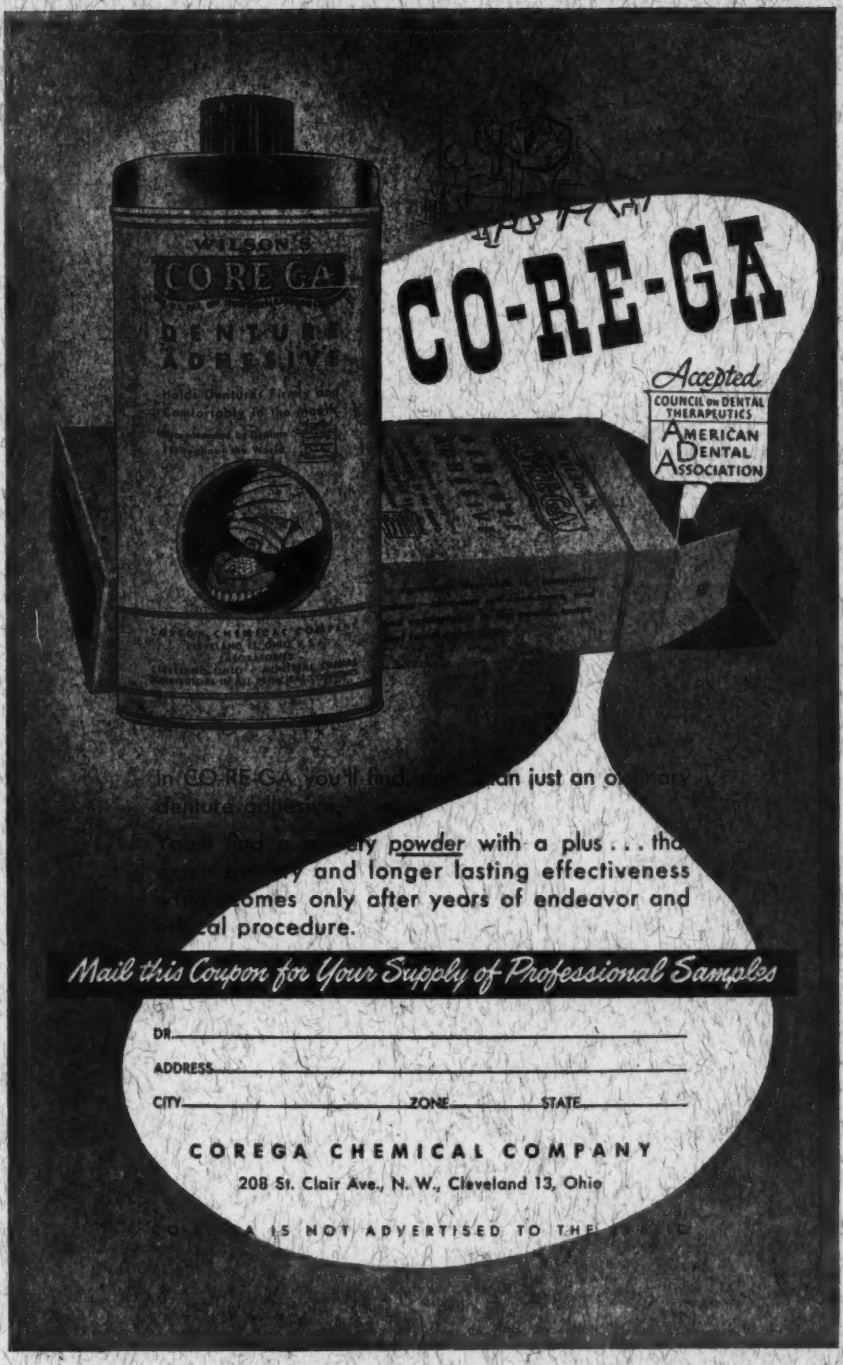
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